GOVERNMENT OF
NEWFOUNDLAND
AND LABRADOR

A GREEN PAPER

ON CHANGING NEWFOUNDLAND AND LABRADOR'S TIME PRACTICES

Department of Culture, Recreation and Youth

FEBRUARY 1987

A GREEN PAPER ON CHANGING NEWFOUNDLAND AND LABRADOR'S TIME PRACTICES

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PURPOSE OF PAPER

The impetus for this paper arose from the fact that there is considerable daylight 'wasted' each year in this Province. During the Spring and Summer months there is daylight before most people are awake in the mornings. Many people believe that considerable benefits would result from changing Newfoundland's time practices to better utilize the hours of daylight available each day. This has led to Government initiating an examination of Newfoundland's time practices and possible proposals for change. Government itself has adopted a neutral stance on this issue but is prepared to consider change should there be general public support.

This paper demonstrates that changing Newfoundland's time practices will involve different implications for different parts of the Province. This study has been prepared to present to residents the options and implications of changing the timing of the daylight hours in this Province. The Government now wishes to solicit the opinions of all interested citizens, groups, Newfoundlanders, organizations, companies and other affected parties regarding these proposed changes.

ALL SUBMISSIONS SHOULD BE MADE IN WRITING AND FORWARDED TO:
Mr. W. B. Frost, Assistant Deputy Minister,
Department of Culture, Recreation and Youth,
Government of Newfoundland and Labrador
West Block,
Confederation Building
St. John's, A1C 5T7
NO LATER THAN June 30, 1987.

EXECUTIVE SUMMARY

The issues of changing Newfoundland Standard Time and its Daylight Saving Time practices have been explored frequently in the last two decades. Many people believe there is considerable merit in changing Newfoundland's time practices so that a better utilization of existing daylight hours results. This paper is designed to address a number of topics regarding this issue.

Historically systems of time measurement evolved with the growing interdependence among communities. Initially, most communities simply kept their own local time. Advancements in transportation and communications especially in the 1880's, however, increased the need for the standardization of time around the world. In 1884 at the International Meridan Conference, International Standard Time with Greenwich England as the prime meridian became the method of time measurement which most countries in the world observed.

In Newfoundland, Greenwich Mean Time (GMT) was being observed as early as 1875 but GMT was formally adopted into legislation only in 1937. In the 1960's two attempts were made to change Newfoundland's time practices. The first, proposed in 1963 would have made Atlantic Standard Time the Standard Time for Newfoundland as well. In 1967 it was proposed that the practice of Daylight Saving Time be extended in this Province. Neither of these proposals were adopted into legislation.

Newfoundland Standard Time is somewhat of an anomoly, as far as time zones are concerned, in that it is 3 1/2 hours West of GMT instead of an integral number of hours, as is the norm. Most of Labrador by convention observes Atlantic Standard Time which is 4 hours West of GMT. In addition, past and existing time practices in the world indicate that strict adherence to GMT is the exception not the rule. Many countries in the world have changed their standard times to conform with geographic boundaries and for convenience purposes. There is no taboo associated with changing either a country's standard time or its daylight saving time practices. The United States, for example, decided this year that, starting in 1987, it would begin to observe daylight savings time on the first Sunday in April instead of on the last Sunday in April, as is now the case.

There are a number of reasons favouring a change in Newfoundland's time practices. Utilizing daylight time more effectively will provide individuals and groups with greater opportunities for participating in recreational and leisure activities in the evening hours. It would also lower consumer's electricity bills. Other incidental benefits which might arise from changing Newfoundland time practices include such things as a reduction in social problems, improved highway safety, and more effective utilization of communications. Change, however, might introduce new problems for people who may have to get up in the dark for a few extra weeks each year and for national and international companies and organizations operating in Newfoundland to whom the uniformity of time practices among provinces and countries is important.

The existing system is outlined in tables 4.1 and 4.2. This paper investigates several proposals for changing this system. These include in addition to maintaining the status quo:

1. Extending Daylight Savings Time from the first Sunday in March to the last Sunday in October;
2. Advancing Standard Time one half hour;
3. Advancing Standard Time one half hour and extending Daylight Saving Time from the first Sunday in March to the last Sunday in October;
4. Adopting Double Daylight Saving Time from the first Sunday in April to the last Sunday in October;
5. Advancing Standard Time one half hour and adopting Double Daylight Saving Time from the first Sunday in April to the last Sunday in October; and,
6. For Labrador, recognizing the observance of Atlantic Standard Time in the legislation.

Each of these options is discussed and evaluated for various locations around the Island and in Labrador so that residents can better evaluate the effects of change on them.

Following the receipt of comments and their review by Government, a decision will be made on which option, if any, is best to implement.

1. HISTORICAL BACKGROUND

A. General

Time is a basic notion which allows us to perceive of an ordering in the occurrence of events. As societies evolved so did the mesurement of time. Prior to the mid-nineteenth century in most countries, each town or community kept its own local time. Later advancements in transportation and communication, particularly in railroads and telegraphs, resulted in an increased need for the standardization of time.

The major commercial nations of the world were actively engaged in discussions concerning the standardization of time in the 1870's. A proposal advocated by Sandford Fleming, a Canadian and the American, Charles F. Dowd was of particular interest. They supported a system of standard time in which the earth would be divided into 24 time zones, each 15 degrees wide, the first being centred on the Greenwich Meridian. Each successive standard time zone would differ from the standard time of Greenwich by whole hour units. People in places lying to the east of the prime meridian see the sunrise before Greenwich, so their time would be early relative to Greenwich. Places to the west of Greenwich see sunrise later in the day so their time would be late relative to Greenwich. Accordingly, when it was noon in Greenwich at 0° longitude, it would be 5 a.m. in New York at 75° West longitude and 3 p.m. in Moscow at 45° East longitude. This system of Greenwich Mean Time (GMT), which was already in use in Britain was adopted by railway managers in the United States and Canada prior to the 1880's.

In 1884 International Standard Time with Greenwich as the prime meridian was approved by the International Meridian Conference which was held in Washington, D.C. Today most countries use Greenwich Mean Time (GMT) as the basis for their standard time, with a notable exception being Saudi Arabia which uses Sun Time. In some cases GMT is strictly observed but some areas have opted to adopt a time zone which is halfway between two meridians, as is the case in Newfoundland. In addition, many time zones have also been changed to conform with geographic boundaries and for reasons of convenience.

B. History in Newfoundland

As early as 1875, St. John's local time was set in the Newfoundland Almanac as being 3 hours 30 minutes later than Greenwich mean time. It appears that this time later became the time of the entire Island. Communities in Labrador later chose the zone, either Newfoundland or Atlantic Standard Time, which was considered most convenient.

Newfoundland formally adopted Greenwich mean time effective in 1937. The first piece of Newfoundland legislation, **Standard Time (Newfoundland) Act 1935,** refers to Newfoundland time being 3 hours 30 minutes later than Greenwich. Subsequent pieces of legislation, now referred to as the **Newfoundland Standard Time Act** all refer to Newfoundland time being 3 hours 30 minutes later than Greenwich Time. A copy of the present legislation is attached as Appendix A.

There have been two attempts to amend the present legislation. In May 1963, the Government tabled Bill 54, which proposed to shift our time by one half hour relative to Greenwich. This would ensure a uniform time zone with the Maritime Provinces. This legislation met with considerable public opposition and died on the order paper when the legislature was dissolved.

In February 1967, a private members bill was introduced to the House of Assembly which provided for an extension of Newfoundland Daylight Savings time from the last Sunday in October to the last Sunday in December. This bill passed second reading in the House of Assembly, and was subsequently referred to a select Committee of the legislature, where it died.

2. EXISTING SYSTEM

In Canada, the determination of time is considered a matter of provincial jurisdiction. There are six time zones in Canada extending almost 90 degrees from East to West. Newfoundland Standard Time (N.S.T.), used throughout the Island and the Straits of Labrador, is located at the meridian 52 1/2° west of Greenwich, which is minus three and one half hours universal co-ordinated time (UTC). The other time zones in Canada range from Atlantic Standard Time, used by Labrador communities north of Port Hope Simpson (half hour behind N.S.T. and minus 4 hours UTC) to Pacific Standard Time which is four and one half hours behind N.S.T. and minus 8 hours (U.T.C.).

Newfoundland is the only jurisdiction in North America to choose a half hour time zone, a practice which is not common throughout the world. Newfoundland, as well as such countries as Afghanistan, Burma, India, Iran, Sri-Lanka and Australia have this distinction.

Most Provinces in Canada and many countries in the world use Daylight Savings Time to extend natural light into the evening. Daylight Savings Time is a system one hour in advance of Standard Time and in North America is observed for a period of six months between the last Sunday in April to the last Sunday in October. There are exceptions to this, as most of Saskatchewan for example, is on Standard time year round.

A considerable degree of flexibility has been exercised worldwide in determining appropriate time zones. As the detailed world map on the back cover indicates, few of the 24 original time zones have remained intact. It would appear that being in a time zone consistent with the universal co-ordinated time zones as indicated on the map is the exception as opposed to the rule. Some examples illustrating this point include:

- China, which geographically extends over 4 time zones, is all on the same time;
- Israel which, primarily for religious reasons, is about two hours behind its appropriate time zone;
- The United Kingdom and the Republic of Ireland which are in the same time zone as Portugal, although Spain, France, the rest of Europe and Scandinavia are in another zone;
- St. Pierre and Miquelon which, although theoretically

part of Newfoundland Standard Time, have advanced their time one half hour to move closer to European time;

- Afghanistan, Burma, India, Iran, Sri-Lanka and part of Australia which have adopted half hour spacing; and,
- Eastern Quebec which, although theoretically part of Atlantic Standard Time, is part of Eastern Standard Time. Similarly Western Ontario which should theoretically be in the Central Time Zone like Manitoba, remains part of the Eastern Standard Time Zone.

There are also numerous examples of countries which have retained separate time systems or made alterations on an experimental basis. These include:

- The Soviet Union which remains on daylight savings time year round.
- The practice of a number of countries, including the United States, to utilize year round daylight saving time during World War II. Britain and Newfoundland utilized double daylight savings time during World War II in which clocks were running two hours ahead of their standard time.
- Experiments by both the United States and Britain to utilize year round daylight savings time in 1974 and 1968-1971 respectively. The United States recently passed legislation which would extend daylight savings time by one month, to take effect on April 5, 1987.

3. REASONS FOR CHANGE

There is considerable merit in utilizing daylight time more effectively. Within the context of this analysis, first light or dawn is when daylight first appears in the morning sky, usually around one half hour before sunrise. Last light or dusk is the last appearance of light in the evening sky, usually occurring one half hour after sunset. It is generally considered that most outdoor activities are possible in dawn or dusk without the benefit of artificial light. Under the current system, much daylight is 'wasted' particularly in the spring and summer months because first light occurs long before most people are awake in the mornings.

Tables 4.1 and 4.2 display existing first and last light times for various locations across the Island. As these tables demonstrate, first light occurs between 4:00 and 6:00 a.m. all across the Province from March to the end of August. This means that there is daylight before most people are awake in the mornings. In addition, throughout the winter months last light occurs around 5:00 to 6:00 p.m. while in the months of March and April, it does not extend beyond 8:00 p.m. in most locations. Hence, there is very limited daylight after working hours during the winter and early spring months under our existing time practice.

Changes to Newfoundland time could positively affect many residents of this Province. The changes would have their most noticeable impact by increasing the time in which individuals and groups can pursue their favourite recreational or leisure activities and by reducing consumers electrical costs. Individuals would also benefit, although to a lesser extent, in a number of other ways including a possible reduction in crime, improved highway safety and improved efficiencies through our existing usage of telecommunications facilities.

A. MAJOR BENEFITS

1. Increased Recreational and Leisure Activities

Advancing our Standard Time and/or extending our Daylight Savings Time would result in a considerable increase in daylight for the evening hours. This would provide individuals and groups with a greater opportunity to participate in their favourite recreational and leisure activities including gardening, shopping and sports. It would also provide organized sports leagues with more daylight hours in the evenings for their activities.

As Table 4.4 indicates, advancing our Daylight Savings Time to the first week of March would result in a much later dusk for the March and April months. For example, dusk on the Avalon Peninsula for this period would be from 7:30 - 8:00 p.m. compared to the present system of 6:30-7:00 p.m.

Changes to our time, resulting in an increased participation in recreational and leisure activities, would also benefit the provincial retail sector through increased sales of such items as gardening supplies, sporting equipment and accessories.

2. Reduced Energy Costs

A better utilization of daylight hours would decrease the consumption of electricity. There would be less need for illumination in homes and to a much lesser extent in stores, offices and factories during the late afternoon and early evening hours. This change in consumption precipitated by an extension of daylight into the evening hours, would ultimately result in a savings in consumer electrical bills if there is no increased need for illumination in the morning.

A review completed by Newfoundland and Labrador Hydro indicates that an extension of Daylight Savings Time would save the consumer between $1.20 and $1.50 for each additional month of daylight savings time. The National Research Council arrived at a similar conclusion for the rest of the Country. Newfoundland and Labrador Hydro also anticipates that it can save upwards to $400,000 per year because of a decreased demand for oil-fired electricity.

B. INCIDENTAL BENEFITS

3. Reduction in Social Problems

Studies completed in the United States have concluded that an extension of daylight into the evening hours may reduce the opportunity for serious crime to be committed. When combined with the potential for a greater participation in leisure and recreational activities, the rate of crime may be marginally reduced.

TABLE 4.1
ISLAND EXISTING SYSTEM
FIRST LIGHT - A.M.

Date	Port Aux Basques	Corner Brook	St. Anthony	Grand Falls	Twillingate	Gander	Marystown	Bonavista	Argentia	St. John's
JANUARY										
1	7:39	7:39	7:38	7:29	7:28	7:25	7:22	7:18	7:18	7:13
16	7:35	7:34	7:32	7:25	7:23	7:20	7:18	7:14	7:14	7:09
31	7:22	7:20	7:16	7:11	7:09	7:06	7:05	7:00	7:01	6:56
FEBRUARY										
5	7:15	7:13	7:09	7:04	7:02	7:00	6:59	6:53	6:54	6:50
15	7:01	6:58	6:52	6:49	6:46	6:44	6:45	6:38	6:40	6:35
25	6:44	6:40	6:33	6:31	6:28	6:27	6:28	6:21	6:23	6:18
MARCH										
2	6:35	6:31	6:22	6:22	6:18	6:17	6:19	6:11	6:14	6:09
17	6:06	6:00	5:49	5:51	5:47	5:47	5:50	5:41	5:45	5:40
27	5:45	5:39	5:26	5:30	5:25	5:25	5:30	5:20	5:25	5:19
APRIL										
1	5:35	5:28	5:15	5:19	5:14	5:14	5:19	5:09	5:15	5:09
16	5:04	4:56	4:40	4:47	4:41	4:42	4:49	4:37	4:44	4:38
26	4:45	4:36	4:18	4:26	4:20	4:22	4:30	4:17	4:25	4:19
MAY										
1	5:36	5:26	5:07	5:17	5:11	5:12	5:21	5:08	5:16	5:10
16	5:12	5:00	4:38	4:51	4:44	4:47	4:57	4:43	4:52	4:46
31	4:55	4:42	4:17	4:33	4:25	4:29	4:41	4:25	4:36	4:29
JUNE										
5	4:51	4:38	4:13	4:29	4:21	4:25	4:37	4:21	4:32	4:25
15	4:48	4:34	4:08	4:25	4:17	4:21	4:34	4:17	4:29	4:22
30	4:52	4:38	4:12	4:29	4:21	4:25	4:38	4:21	4:33	4:26
JULY										
5	4:55	4:42	4:16	4:33	4:25	4:29	4:42	4:25	4:36	4:29
15	5:05	4:53	4:28	4:44	4:36	4:39	4:51	4:35	4:46	4:39
30	5:25	5:14	4:52	5:05	4:58	5:00	5:10	4:56	5:05	4:59
AUGUST										
4	5:32	5:21	5:01	5:12	5:05	5:08	5:18	5:03	5:12	5:06
14	5:47	5:37	5:18	5:28	5:22	5:23	5:32	5:19	5:27	5:21
29	6:08	6:00	5:45	5:51	5:46	5:47	5:53	5:42	5:48	5:43
SEPTEMBER										
3	6:16	6:08	5:53	5:59	5:54	5:54	6:00	5:49	5:56	5:50
18	6:37	6:30	6:18	6:21	6:17	6:17	6:21	6:11	6:16	6:11
28	6:50	6:45	6:35	6:36	6:32	6:31	6:35	6:26	6:30	6:24
OCTOBER										
3	6:57	6:52	6:43	6:43	6:39	6:39	6:41	6:33	6:37	6:31
18	7:18	7:14	7:07	7:05	7:02	7:01	7:02	6:55	6:57	6:52
28	6:32	6:29	6:24	6:20	6:18	6:16	6:16	6:10	6:11	6:06
NOVEMBER										
2	6:30	6:39	6:32	6:28	6:25	6:23	6:23	6:17	6:18	6:13
17	7:01	6:59	6:56	6:50	6:48	6:45	6:44	6:39	6:39	6:35
27	7:14	7:13	7:11	7:03	7:02	6:59	6:57	6:52	6:52	6:48
DECEMBER										
2	7:20	7:19	7:17	7:10	7:08	7:05	7:02	6:58	6:58	6:54
17	7:33	7:33	7:32	7:24	7:23	7:19	7:16	7:13	7:12	7:07
31	7:39	7:39	7:38	7:29	7:28	7:25	7:22	7:18	7:18	7:13

NOTES:

1. Times were prepared by Dr. Paul Feldman of the Herzberg Institute of Astrophysics, a Division of the National Research Council of Canada.
2. Times are for 1986.
3. First light occurs approximately one half hour before sunrise.

TABLE 4.2
ISLAND EXISTING SYSTEM
LAST LIGHT - P.M.

Date	Port Aux Basques	Corner Brook	St. Anthony	Grand Falls	Twillingate	Gander	Marystown	Bonavista	Argentia	St. John's
JANUARY										
1	5:21	5:12	4:54	5:03	4:57	4:59	5:07	4:54	5:02	4:56
16	5:38	5:30	5:13	5:20	5:15	5:16	5:23	5:11	5:18	5:12
31	5:59	5:51	5:36	5:42	5:37	5:38	5:44	5:33	5:39	5:33
FEBRUARY										
5	6:06	5:59	5:45	5:50	5:45	5:45	5:51	5:40	5:46	5:41
15	6:21	6:15	6:02	6:06	6:01	6:01	6:06	5:56	6:01	5:55
25	6:36	6:30	6:19	6:21	6:17	6:17	6:20	6:11	6:16	6:10
MARCH										
2	6:43	6:38	6:28	6:29	6:25	6:25	6:28	6:19	6:23	6:18
17	7:05	7:01	6:53	6:52	6:49	6:48	6:49	6:42	6:45	6:39
27	7:20	7:17	7:10	7:08	7:05	7:03	7:04	6:57	6:59	6:54
APRIL										
1	7:27	7:25	7:19	7:15	7:13	7:11	7:11	7:05	7:06	7:01
16	7:50	7:48	7:46	7:39	7:38	7:35	7:33	7:28	7:29	7:24
26	8:05	8:05	8:04	7:56	7:54	7:51	7:48	7:44	7:44	7:39
MAY										
1	9:13	9:13	9:13	9:04	9:03	8:59	8:55	8:52	8:51	8:47
16	9:35	9:37	9:40	9:28	9:28	9:23	9:17	9:16	9:13	9:09
31	9:54	9:57	10:03	9:48	9:49	9:44	9:36	9:36	9:32	9:28
JUNE										
5	9:59	10:03	10:10	9:53	9:54	9:49	9:41	9:41	9:37	9:33
15	10:06	10:10	10:18	10:01	10:02	9:57	9:48	9:49	9:44	9:40
30	10:08	10:12	10:19	10:03	10:04	9:58	9:50	9:51	9:46	9:42
JULY										
5	10:06	10:10	10:17	10:01	10:01	9:56	9:48	9:48	9:44	9:40
15	9:59	10:02	10:07	9:52	9:53	9:48	9:41	9:41	9:37	9:33
30	9:40	9:42	9:44	9:32	9:32	9:28	9:23	9:21	9:19	9:14
AUGUST										
4	9:32	9:33	9:35	9:24	9:23	9:20	9:15	9:13	9:11	9:06
14	9:15	9:15	9:14	9:06	9:04	9:01	8:58	8:54	8:53	8:49
29	8:46	8:44	8:41	8:35	8:33	8:30	8:29	8:24	8:24	8:20
SEPTEMBER										
3	8:35	8:33	8:29	8:24	8:22	8:20	8:19	8:13	8:14	8:09
18	8:04	8:00	7:54	7:51	7:48	7:47	7:48	7:41	7:43	7:38
28	7:43	7:39	7:31	7:30	7:26	7:25	7:27	7:19	7:23	7:17
OCTOBER										
3	7:33	7:28	7:19	7:19	7:16	7:15	7:17	7:09	7:13	7:07
18	7:05	6:59	6:47	6:50	6:45	6:45	6:49	6:40	6:44	6:39
28	5:48	5:41	5:28	5:32	5:27	5:27	5:32	5:22	5:28	5:22
NOVEMBER										
2	5:40	5:33	5:19	5:24	5:19	5:20	5:25	5:14	5:20	5:14
17	5:22	5:14	4:58	5:05	4:59	5:00	5:07	4:55	5:02	4:56
27	5:14	5:06	4:49	4:57	4:51	4:52	5:00	4:47	4:55	4:49
DECEMBER										
2	5:12	5:03	4:46	4:54	4:48	4:50	4:57	4:45	4:52	4:46
17	5:12	5:03	4:44	4:53	4:47	4:49	4:57	4:44	4:52	4:46
31	5:20	5:11	4:53	5:02	4:56	4:57	5:06	4:53	5:01	4:54

1. Times were prepared by Dr. Paul Feldman of the Herzberg Institute of Astrophysics, a Division of the National Research Council of Canada.
2. Times are for 1986.
3. Last light occurs approximately one half hour after sunset.

4. Improved Highway Safety

A great number of motor vehicle accidents occur in the evening hours, after dusk. This is especially evident in the winter months, during peak hours, and in adverse weather conditions, when motorists are required to leave work in complete darkness. For example, under our current system, in the months of November, December and January, dusk is experienced shortly after 4:30 p.m. in many areas of the Province. The adoption of a proposal to change our Standard Time and/or extend Daylight Savings Time would result in an extension of daylight hours well into the evening which would facilitate a safer driving environment. The change in our time would, in particular, allow for a safer environment for our children returning home from school or from extra-curricular activities after school.

C. POSSIBLE DISADVANTAGES

These changes would not be without disadvantages to some people in the Province. Extended periods of late mornings throughout the winter and into the Spring may not be attractive to early risers, in particular. In addition, there might be some adverse consequences for transportation and communication where there are some advantages to maintaining uniformity across the country (eg. television programming). A unilateral move on the part of Newfoundland to extend its daylight saving time to March for example, would place this Province 1 1/2 hours ahead of the Maritimes and 2 1/2 hours ahead of Ontario only for March and April each year. Such changes could cause some difficulties for nation-wide institutions such as banks, airlines and other large businesses.

4. POLICY OPTIONS

A. ISLAND

1. Extend Daylight Saving Time from the First Sunday in March to the Last Sunday in October.

One possible option which might be implemented to achieve more daylight during the waking hours would be to extend Daylight Saving Time for an extra two months, into the months of March and April. Under this option, clocks would advance one hour on the first Sunday in March and return to Standard Time on the last Sunday in October. Currently, we move to Daylight Saving Time on the last Sunday in April. Tables 4.3 and 4.4 provide first and last light times under this case for various Island locations. In addition, Figures 4.1 to 4.3 graphically demonstrate the existing pattern of first and last light times for Corner Brook, Grand Falls and St. John's, along with the implications of this particular change.

From the tables and graphs it is clear that this option allows much lost daylight to be captured in the Spring months of March and April. First light during these months would extend only as late as 7:35 a.m. on the West Coast of the Province and to around 7:00 a.m. on the East Coast. In addition, this option would lengthen the evening daylight hours in March and April to as late as 9:00 p.m. on the West Coast and 8:30 p.m. on the East Coast.

One difficulty which might arise in this case would result from having late first light times into March after the long winter period of late mornings. Tables 4.3 and 4.4 suggest, however, that the very latest mornings would only occur during the first week in March. By mid-March, only the extreme West Coast of the Province would experience first light times after 7:00 a.m. As well, having daylight extend in the evenings well into 8:00 p.m. and 9:00 p.m. may represent an adequate trade-off to people who must get up in the dark for an extra couple of weeks each year.

FIGURE 4.1
CORNER BROOK
CIVIL TWILIGHT TIMES

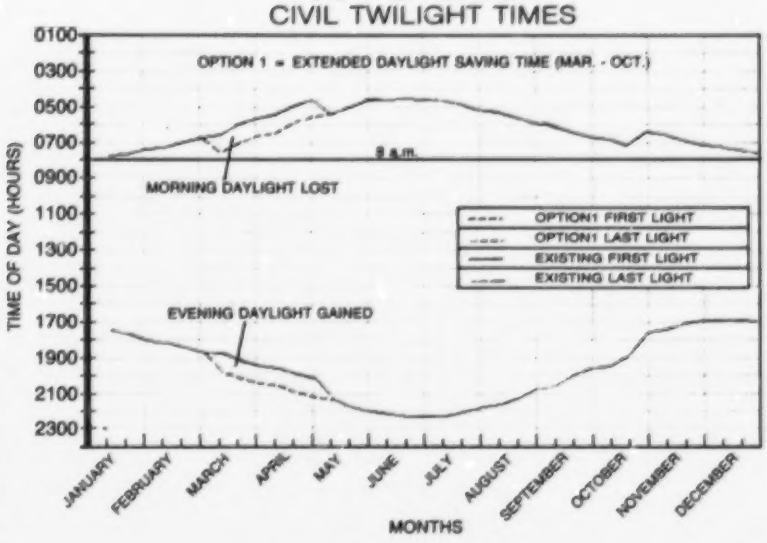

FIGURE 4.2
GRAND FALLS
CIVIL TWILIGHT TIMES

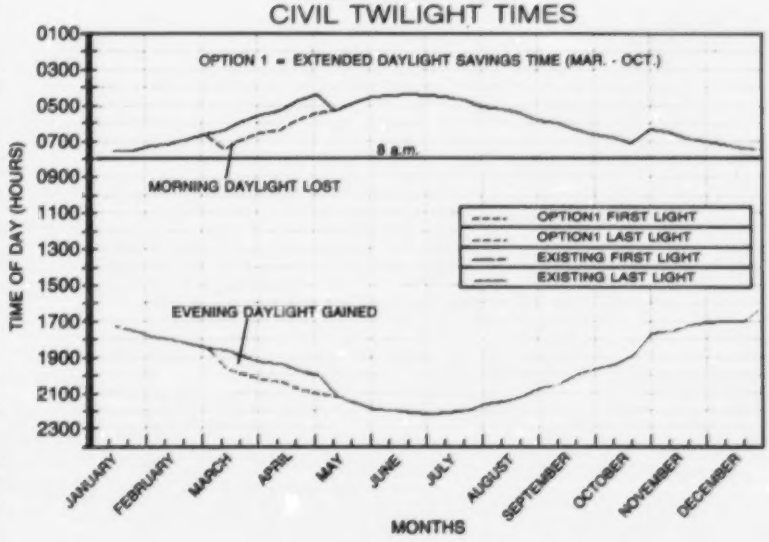

FIGURE 4.3
ST. JOHN'S
CIVIL TWILIGHT TIMES

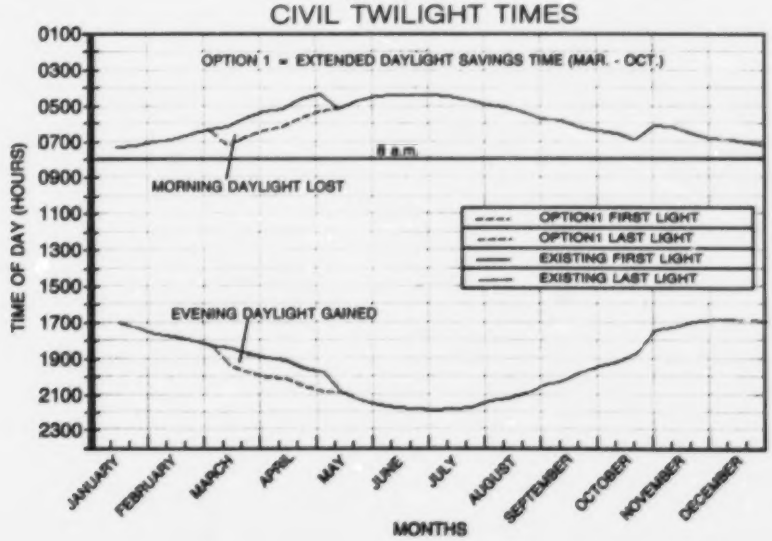

TABLE 4.3
OPTION 1
ISLAND EXISTING SYSTEM WITH EXTENDED DAYLIGHT SAVING TIME
MARCH - OCTOBER
FIRST LIGHT - A.M.

Date	Port Aux Basques	Corner Brook	St. Anthony	Grand Falls	Twillingate	Gander	Marystown	Bonavista	Argentia	St. John's
JANUARY										
1	7:39	7:39	7:38	7:29	7:28	7:25	7:22	7:18	7:18	7:13
16	7:35	7:34	7:32	7:25	7:23	7:20	7:18	7:14	7:14	7:09
31	7:22	7:20	7:16	7:11	7:09	7:06	7:05	7:00	7:01	6:56
FEBRUARY										
5	7:15	7:13	7:09	7:04	7:02	7:00	6:59	6:53	6:54	6:50
15	7:01	6:58	6:52	6:49	6:46	6:44	6:45	6:38	6:40	6:35
25	6:44	6:40	6:33	6:31	6:28	6:27	6:28	6:21	6:23	6:18
MARCH										
2	7:35	7:31	7:22	7:22	7:18	7:17	7:19	7:11	7:14	7:09
17	7:06	7:00	6:49	6:51	6:47	6:47	6:50	6:41	6:45	6:40
27	6:45	6:39	6:26	6:30	6:25	6:25	6:30	6:20	6:25	6:19
APRIL										
1	6:35	6:28	6:15	6:19	6:14	6:14	6:19	6:09	6:15	6:09
16	6:04	5:56	5:40	5:47	5:41	5:42	5:49	5:37	5:44	5:38
26	5:45	5:36	5:18	5:26	5:20	5:22	5:30	5:17	5:25	5:19
MAY										
1	5:36	5:26	5:07	5:17	5:11	5:12	5:21	5:08	5:16	5:10
16	5:12	5:00	4:38	4:51	4:44	4:47	4:57	4:43	4:52	4:46
31	4:55	4:42	4:17	4:33	4:25	4:29	4:41	4:25	4:36	4:29
JUNE										
5	4:51	4:38	4:13	4:29	4:21	4:25	4:37	4:21	4:32	4:25
15	4:48	4:34	4:08	4:25	4:17	4:21	4:34	4:17	4:29	4:22
30	4:52	4:38	4:12	4:29	4:21	4:25	4:38	4:21	4:33	4:26
JULY										
5	4:55	4:42	4:16	4:33	4:25	4:29	4:42	4:25	4:36	4:29
15	5:05	4:53	4:28	4:44	4:36	4:39	4:51	4:35	4:46	4:39
30	5:25	5:14	4:52	5:05	4:58	5:00	5:10	4:56	5:05	4:59
AUGUST										
4	5:32	5:21	5:01	5:12	5:05	5:08	5:18	5:03	5:12	5:06
14	5:47	5:37	5:18	5:28	5:22	5:23	5:32	5:19	5:27	5:21
29	6:08	6:00	5:45	5:51	5:46	5:47	5:53	5:42	5:48	5:43
SEPTEMBER										
3	6:16	6:08	5:53	5:59	5:54	5:54	6:00	5:49	5:56	5:50
18	6:37	6:30	6:18	6:21	6:17	6:17	6:21	6:11	6:16	6:11
28	6:50	6:45	6:35	6:36	6:32	6:31	6:35	6:26	6:30	6:24
OCTOBER										
3	6:57	6:52	6:43	6:43	6:39	6:39	6:41	6:33	6:37	6:31
18	7:18	7:14	7:07	7:05	7:02	7:01	7:02	6:55	6:57	6:52
28	6:32	6:29	6:24	6:20	6:18	6:16	6:16	6:10	6:11	6:06
NOVEMBER										
2	6:39	6:37	6:32	6:28	6:25	6:23	6:23	6:17	6:18	6:13
17	7:01	6:59	6:56	6:50	6:48	6:45	6:44	6:39	6:39	6:35
27	7:14	7:13	7:11	7:03	7:02	6:59	6:57	6:52	6:52	6:48
DECEMBER										
2	7:20	7:19	7:17	7:10	7:08	7:05	7:02	6:58	6:58	6:54
17	7:33	7:33	7:32	7:24	7:23	7:19	7:16	7:13	7:12	7:07
31	7:39	7:39	7:38	7:29	7:28	7:25	7:22	7:18	7:18	7:13

NOTES:
1. First light occurs approximately one half hour before sunrise.

TABLE 4.4
OPTION 1
ISLAND EXISTING SYSTEM WITH EXTENDED DAYLIGHT SAVING TIME
MARCH - OCTOBER
LAST LIGHT - P.M.

Date	Port Aux Basques	Corner Brook	St. Anthony	Grand Falls	Twillingate	Gander	Marystown	Bonavista	Argentia	St. John's
JANUARY										
1	5:21	5:12	4:54	5:03	4:57	4:59	5:07	4:54	5:02	4:56
16	5:38	5:30	5:13	5:20	5:15	5:16	5:23	5:11	5:18	5:12
31	5:59	5:51	5:36	5:42	5:37	5:38	5:44	5:33	5:39	5:33
FEBRUARY										
5	6:06	5:59	5:45	5:50	5:45	5:45	5:51	5:40	5:46	5:41
15	6:21	6:15	6:02	6:06	6:01	6:01	6:06	5:56	6:01	5:55
25	6:36	6:30	6:19	6:21	6:17	6:17	6:20	6:11	6:16	6:10
MARCH										
2	7:43	7:38	7:28	7:29	7:25	7:25	7:28	7:19	7:23	7:18
17	8:05	8:01	7:53	7:52	7:49	7:48	7:49	7:42	7:45	7:39
27	8:20	8:17	8:10	8:08	8:05	8:03	8:04	7:57	7:59	7:54
APRIL										
1	8:27	8:25	8:19	8:15	8:13	8:11	8:11	8:05	8:06	8:01
16	8:50	8:48	8:46	8:39	8:38	8:35	8:33	8:28	8:29	8:24
26	9:05	9:05	9:04	8:56	8:54	8:51	8:48	8:44	8:44	8:39
MAY										
1	9:13	9:13	9:13	9:04	9:03	8:59	8:55	8:52	8:51	8:47
16	9:35	9:37	9:40	9:28	9:28	9:23	9:17	9:16	9:13	9:09
31	9:54	9:57	10:03	9:48	9:49	9:44	9:36	9:36	9:32	9:28
JUNE										
5	9:59	10:03	10:10	9:53	9:54	9:49	9:41	9:41	9:37	9:33
15	10:06	10:10	10:18	10:01	10:02	9:57	9:48	9:49	9:44	9:40
30	10:08	10:12	10:19	10:03	10:04	9:58	9:50	9:51	9:46	9:42
JULY										
5	10:06	10:10	10:17	10:01	10:01	9:56	9:48	9:48	9:44	9:40
15	9:59	10:02	10:07	9:52	9:53	9:48	9:41	9:41	9:37	9:33
30	9:40	9:42	9:44	9:32	9:32	9:28	9:23	9:21	9:19	9:14
AUGUST										
4	9:32	9:33	9:35	9:24	9:23	9:20	9:15	9:13	9:11	9:06
14	9:15	9:15	9:14	9:06	9:04	9:01	8:58	8:54	8:53	8:49
29	8:46	8:44	8:41	8:35	8:33	8:30	8:29	8:24	8:24	8:20
SEPTEMBER										
3	8:35	8:33	8:29	8:24	8:22	8:20	8:19	8:13	8:14	8:09
18	8:04	8:00	7:54	7:51	7:48	7:47	7:48	7:41	7:43	7:38
28	7:43	7:39	7:31	7:30	7:26	7:25	7:27	7:19	7:23	7:17
OCTOBER										
3	7:33	7:28	7:19	7:19	7:16	7:15	7:17	7:09	7:13	7:07
18	7:05	6:59	6:47	6:50	6:45	6:45	6:49	6:40	6:44	6:39
28	5:48	5:41	5:28	5:32	5:27	5:27	5:32	5:22	5:28	5:22
NOVEMBER										
2	5:40	5:33	5:19	5:24	5:19	5:20	5:25	5:14	5:20	5:14
17	5:22	5:14	4:58	5:05	4:59	5:00	5:07	4:55	5:02	4:56
27	5:14	5:06	4:49	4:57	4:51	4:52	5:00	4:47	4:55	4:49
DECEMBER										
2	5:12	5:03	4:46	4:54	4:48	4:50	4:57	4:45	4:52	4:46
17	5:12	5:03	4:44	4:53	4:47	4:49	4:57	4:44	4:52	4:46
31	5:20	5:11	4:53	5:02	4:56	4:57	5:06	4:53	5:01	4:54

1. Last light occurs approximately one half hour after sunset.

2. Advance Newfoundland Standard Time One Half Hour

A second option for changing Newfoundland time involves advancing Newfoundland Standard Time one half hour. This move would place Newfoundland one full hour ahead of the Maritimes and two hours ahead of Ontario. Tables 4.5 and 4.6, along with Figures 4.4 to 4.6, demonstrate what such a change will mean for first and last light times for various locations around the Island.

For the Avalon Peninsula, Bonavista, South Coast and Central Newfoundland first light would never occur after 8:00 a.m. under this option and would occur after 7:30 a.m. only during the months of December and January, when most people are already accustomed to late morning daylight. For Western and North-Western Newfoundland, first morning light would occur somewhat later for a longer period of time. First light would be after 8:00 a.m. in December and January and after 7:30 a.m. for part of November and February as well.

This option, however, would result in later evenings. This will be particularly helpful in the winter months when last light would rarely occur before 5:30 p.m.

In the Spring and Summer months, advancing Standard Time would capture some of the daylight currently lost in the early mornings and would result in daylight extending beyond 10:00 p.m. from mid-May to mid-August on the West Coast and, at least for the months of June and July on the East Coast.

FIGURE 4.4
CORNER BROOK
CIVIL TWILIGHT TIMES

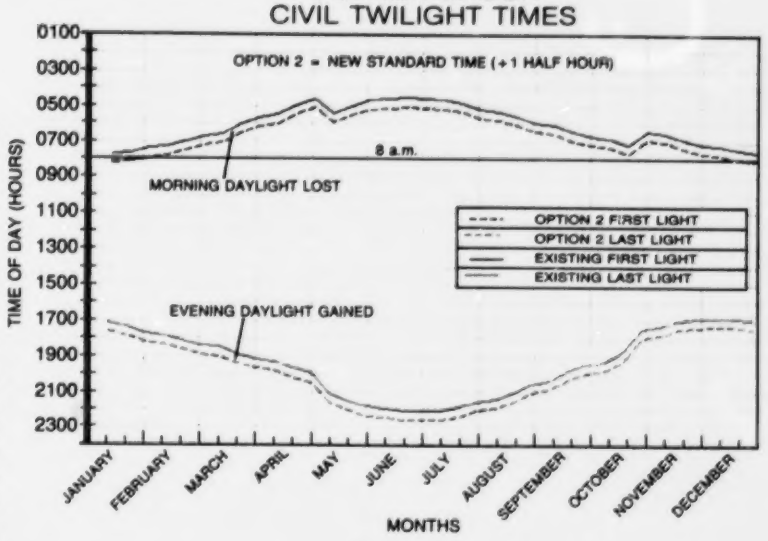

FIGURE 4.5
GRAND FALLS
CIVIL TWILIGHT TIMES

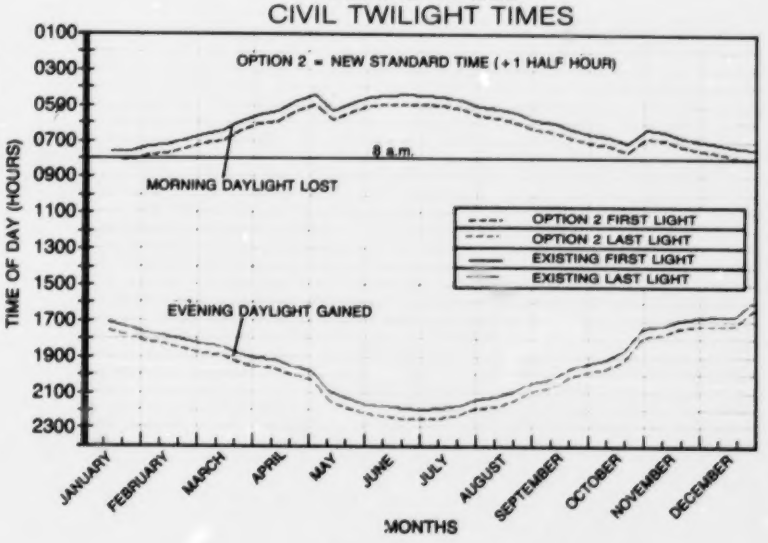

FIGURE 4.6
ST. JOHN'S
CIVIL TWILIGHT TIMES

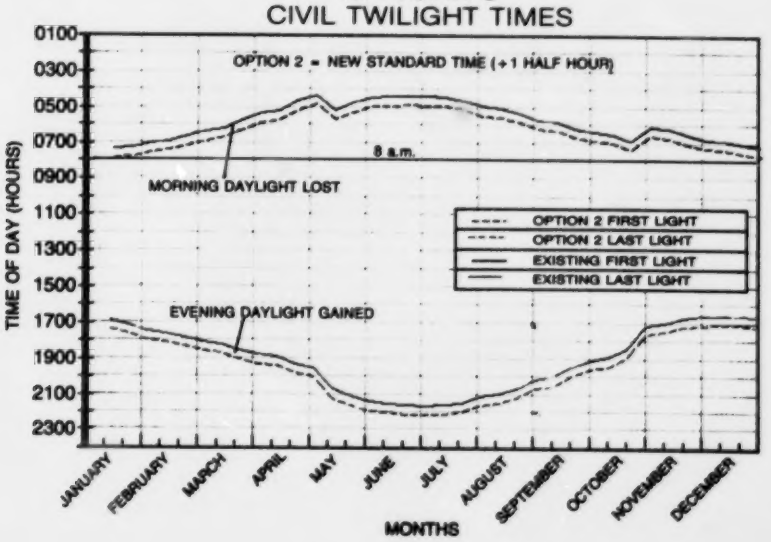

TABLE 4.5
OPTION 2
ISLAND WITH NEW STANDARD TIME (PLUS ONE HALF HOUR)
AND EXISTING DAYLIGHT SAVING TIME
FIRST LIGHT — A.M.

Date	Port Aux Basques	Corner Brook	St. Anthony	Grand Falls	Twillingate	Gander	Marystown	Bonavista	Argentia	St. John's
JANUARY										
1	8:09	8:09	8:08	7:59	7:58	7:55	7:52	7:48	7:48	7:43
16	8:05	8:04	8:02	7:55	7:53	7:50	7:48	7:44	7:44	7:39
31	7:52	7:50	7:46	7:41	7:39	7:36	7:35	7:30	7:31	7:26
FEBRUARY										
5	7:45	7:43	7:39	7:34	7:32	7:30	7:29	7:23	7:24	7:20
15	7:31	7:28	7:22	7:19	7:16	7:14	7:15	7:08	7:10	7:05
25	7:14	7:10	7:03	7:01	6:58	6:57	6:58	6:51	6:53	6:48
MARCH										
2	7:05	7:01	6:52	6:52	6:48	6:47	6:49	6:41	6:44	6:39
17	6:36	6:30	6:19	6:21	6:17	6:17	6:20	6:11	6:15	6:10
27	6:15	6:09	5:56	6:00	5:55	5:55	6:00	5:50	5:55	5:49
APRIL										
1	6:05	5:58	5:45	5:49	5:44	5:44	5:49	5:39	5:45	5:39
16	5:34	5:26	5:10	5:17	5:11	5:12	5:19	5:07	5:14	5:08
26	5:15	5:06	4:48	4:56	4:50	4:52	5:00	4:47	4:55	4:49
MAY										
1	6:06	5:56	5:37	5:47	5:41	5:42	5:51	5:38	5:46	5:40
16	5:42	5:30	5:08	5:21	5:14	5:17	5:27	5:13	5:22	5:16
31	5:25	5:12	4:47	5:03	4:55	4:59	5:11	4:55	5:06	4:59
JUNE										
5	5:21	5:08	4:43	4:59	4:51	4:55	5:07	4:51	5:02	4:55
15	5:18	5:04	4:38	4:55	4:47	4:51	5:04	4:47	4:59	4:52
30	5:22	5:08	4:42	4:59	4:51	4:55	5:08	4:51	5:03	4:56
JULY										
5	5:25	5:12	4:46	5:03	4:55	4:59	5:12	4:55	5:06	4:49
15	5:35	5:23	4:58	5:14	5:06	5:09	5:21	5:05	5:16	5:09
30	5:55	5:44	5:22	5:35	5:28	5:30	5:40	5:26	5:35	5:29
AUGUST										
4	6:02	5:51	5:31	5:42	5:35	5:38	5:48	5:33	5:42	5:36
14	6:17	6:07	5:48	5:58	5:55	5:53	6:02	5:49	5:57	5:51
29	6:38	6:30	6:15	6:21	6:16	6:17	6:23	6:12	6:18	6:13
SEPTEMBER										
3	6:46	6:38	6:23	6:29	6:24	6:24	6:30	6:19	6:26	6:20
18	7:07	7:00	6:48	6:51	6:47	6:47	6:51	6:41	6:46	6:41
28	7:20	7:15	7:05	7:06	7:02	7:01	7:05	6:56	7:00	6:54
OCTOBER										
3	7:27	7:22	7:13	7:13	7:09	7:09	7:11	7:03	7:07	7:01
18	7:48	7:44	7:37	7:35	7:32	7:31	7:32	7:05	7:27	7:22
28	7:02	6:59	6:54	6:50	6:48	6:46	6:46	6:40	6:41	6:36
NOVEMBER										
2	7:09	7:07	7:02	6:58	6:55	6:53	6:53	6:47	6:48	6:43
17	7:31	7:29	7:26	7:20	7:18	7:15	7:14	7:09	7:09	7:05
27	7:44	7:43	7:41	7:33	7:32	7:29	7:27	7:22	7:22	7:18
DECEMBER										
2	7:50	7:49	7:47	7:40	7:38	7:35	7:32	7:28	7:28	7:24
17	8:03	8:03	8:02	7:54	7:53	7:49	7:46	7:43	7:42	7:37
31	8:09	8:09	8:08	7:59	7:58	7:55	7:52	7:48	7:48	7:43

NOTES:
1. First light occurs approximately one half hour before sunrise.

TABLE 4.6
OPTION 2
ISLAND WITH NEW STANDARD TIME (PLUS ONE HALF HOUR)
AND EXISTING DAYLIGHT SAVING TIME.
LAST LIGHT - P.M.

Date	Port Aux Basques	Corner Brook	St. Anthony	Grand Falls	Twillingate	Gander	Marystown	Bonavista	Argentia	St. John's
JANUARY										
1	5:51	5:42	5:24	5:33	5:27	5:29	5:37	5:24	5:32	5:26
16	6:08	6:00	5:43	5:50	5:45	5:46	5:53	5:41	5:48	5:42
31	6:29	6:21	6:06	6:12	6:07	6:08	6:14	6:03	6:09	6:03
FEBRUARY										
5	6:36	6:29	6:15	6:20	6:15	6:15	6:21	6:10	6:16	6:11
15	6:51	6:45	6:32	6:36	6:31	6:31	6:36	6:26	6:31	6:25
25	7:06	7:00	6:49	6:51	6:47	6:47	6:50	6:41	6:46	6:40
MARCH										
2	7:13	7:08	6:58	6:59	6:55	6:55	6:58	6:49	6:53	6:48
17	7:35	7:31	7:23	7:22	7:19	7:18	7:19	7:12	7:15	7:09
27	7:50	7:47	7:40	7:38	7:35	7:33	7:34	7:27	7:29	7:24
APRIL										
1	7:57	7:55	7:49	7:45	7:43	7:41	7:41	7:35	7:36	7:31
16	8:20	8:18	8:16	8:09	8:08	8:05	8:03	7:58	7:59	7:54
26	8:35	8:35	8:34	8:26	8:24	8:21	8:18	8:14	8:14	8:09
MAY										
1	9:43	9:43	9:43	9:34	9:33	9:29	9:25	9:22	9:21	9:17
16	10:05	10:07	10:10	9:58	9:58	9:53	9:47	9:46	9:43	9:39
31	10:24	10:27	10:33	10:18	10:19	10:14	10:06	10:06	10:02	9:58
JUNE										
5	10:29	10:33	10:40	10:23	10:24	10:19	10:11	10:11	10:07	10:03
15	10:36	10:40	10:48	10:31	10:32	10:27	10:18	10:19	10:14	10:10
30	10:38	10:42	10:49	10:33	10:34	10:28	10:20	10:21	10:16	10:12
JULY										
5	10:36	10:40	10:47	10:31	10:31	10:26	10:18	10:18	10:14	10:10
15	10:29	10:32	10:37	10:22	10:23	10:18	10:11	10:11	10:07	10:03
30	10:10	10:12	10:14	10:02	10:02	9:58	9:53	9:51	9:49	9:44
AUGUST										
4	10:02	10:03	10:05	9:54	9:53	9:50	9:45	9:43	9:41	9:36
14	9:45	9:45	9:44	9:36	9:34	9:31	9:28	9:24	9:23	9:19
29	9:16	9:14	9:11	9:05	9:03	9:00	8:59	8:54	8:54	8:50
SEPTEMBER										
3	9:05	9:03	8:59	8:54	8:52	8:50	8:49	8:43	8:44	8:39
18	8:34	8:30	8:24	8:21	8:18	8:17	8:18	8:11	8:13	8:08
28	8:13	8:09	8:01	8:00	7:56	7:55	7:57	7:49	7:53	7:47
OCTOBER										
3	8:03	7:58	7:49	7:49	7:46	7:45	7:47	7:39	7:43	7:37
18	7:35	7:29	7:17	7:20	7:15	7:15	7:19	7:10	7:14	7:09
28	6:18	6:11	5:58	6:02	5:57	5:57	6:02	5:52	5:58	5:52
NOVEMBER										
2	6:10	6:03	5:49	5:54	5:49	5:50	5:55	5:44	5:50	5:44
17	5:52	5:44	5:28	5:35	5:29	5:30	5:37	5:25	5:32	5:26
27	5:44	5:36	5:19	5:27	5:21	5:22	5:30	5:17	5:25	5:19
DECEMBER										
2	5:42	5:33	5:16	5:24	5:18	5:20	5:27	5:15	5:22	5:16
17	5:42	5:33	5:14	5:23	5:17	5:19	5:27	5:14	5:22	5:16
31	5:50	5:41	5:23	5:32	5:26	5:27	5:36	5:23	5:31	5:24

NOTES:
1. Last light occurs approximately one half hour after sunset.

3. Advance Standard Time One Half Hour and Extend Daylight Saving Time From the First Sunday in March to the Last Sunday in October

Tables 4.7 and 4.8 and Figures 4.7 to 4.9 display the first and last light times which will prevail for various locations around the Island for the case of Advancing Standard Time and adopting Daylight Savings Time at the beginning of March. As with Option #2, the West Coast of the Province will experience first light after 8:00 a.m. in December and January and for the first part of March as well. For the East Coast, first light will be after 7:30 a.m. for part of December and January only and it is, therefore, not adversely affected by this option.

At the same time, this option provides for much later early Spring evenings than we currently have. For the month of March, for example, last light will be as late as approximately 9:00 p.m. on the West Coast and 8:30 p.m. on the East Coast of the Island.

FIGURE 4.7
CORNER BROOK
CIVIL TWILIGHT TIMES

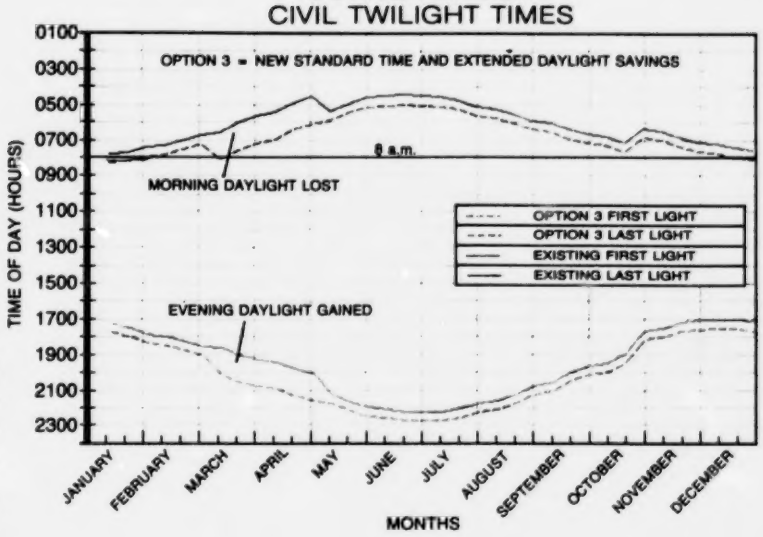

FIGURE 4.8
GRAND FALLS
CIVIL TWILIGHT TIMES

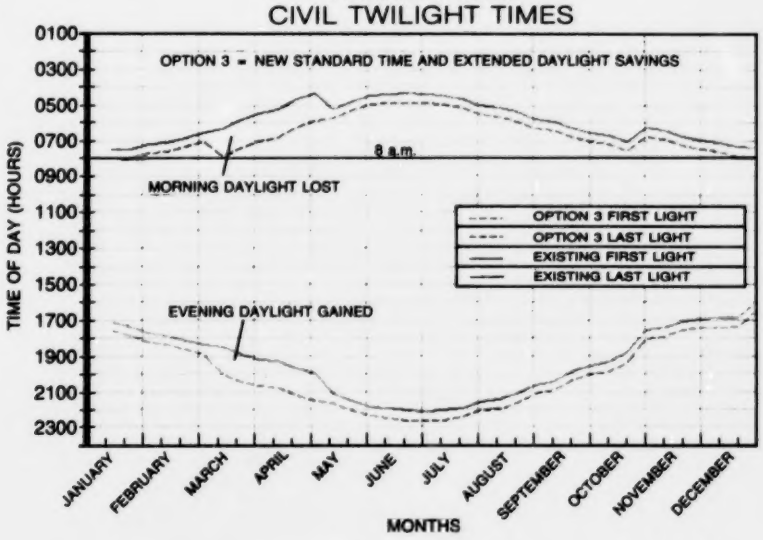

FIGURE 4.9
ST. JOHN'S
CIVIL TWILIGHT TIMES

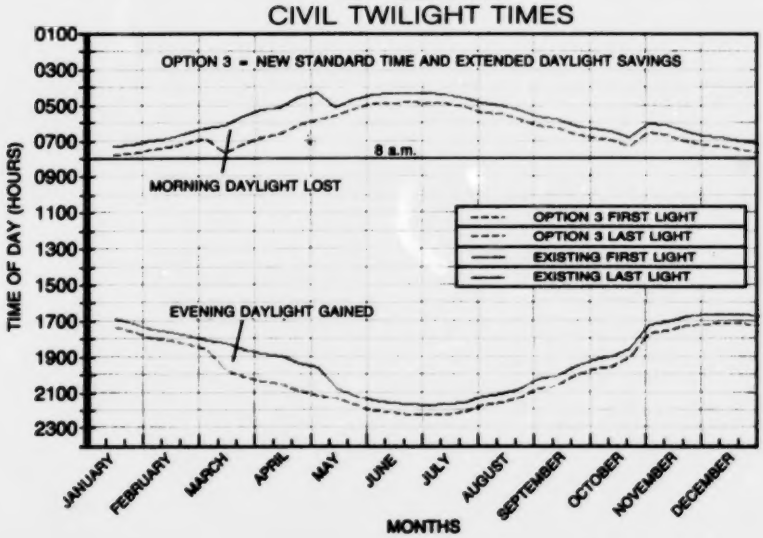

TABLE 4.7
OPTION 3
ISLAND WITH NEW STANDARD TIME (PLUS ONE HALF HOUR)
AND EXTENDED DAYLIGHT SAVING TIME - MARCH - OCTOBER
FIRST LIGHT - A.M.

Date	Port Aux Basques	Corner Brook	St. Anthony	Grand Falls	Twillingate	Gander	Marystown	Bonavista	Argentia	St. John's
JANUARY										
1	8:09	8:09	8:08	7:59	7:58	7:55	7:52	7:48	7:48	7:43
16	8:05	8:04	8:02	7:55	7:53	7:50	7:48	7:44	7:44	7:39
31	7:52	7:50	7:46	7:41	7:39	7:36	7:35	7:30	7:31	7:26
FEBRUARY										
5	7:45	7:43	7:39	7:34	7:32	7:30	7:29	7:23	7:24	7:20
15	7:31	7:28	7:22	7:19	7:16	7:14	7:15	7:08	7:10	7:05
25	7:14	7:10	7:03	7:01	6:58	6:57	6:58	6:51	6:53	6:48
MARCH										
2	8:05	8:01	7:52	7:52	7:48	7:47	7:49	7:41	7:44	7:39
17	7:36	7:30	7:19	7:21	7:17	7:17	7:20	7:11	7:15	7:10
27	7:15	7:09	6:56	7:00	6:55	6:55	7:00	6:50	6:55	6:49
APRIL										
1	7:05	6:58	6:45	6:49	6:44	6:44	6:49	6:39	6:45	6:39
16	6:34	6:26	6:10	6:17	6:11	6:12	6:19	6:07	6:14	6:08
26	6:15	6:06	5:48	5:56	5:50	5:52	6:00	5:47	5:55	5:49
MAY										
1	6:06	5:56	5:37	5:47	5:41	5:42	5:51	5:38	5:46	5:40
16	5:42	5:30	5:08	5:21	5:14	5:17	5:27	5:13	5:22	5:16
31	5:25	5:12	4:47	5:03	4:55	4:59	5:11	4:55	5:06	4:59
JUNE										
5	5:21	5:08	4:43	4:59	4:51	4:55	5:07	4:51	5:02	4:55
15	5:18	5:04	4:38	4:55	4:47	4:51	5:04	4:47	4:59	4:52
30	5:22	5:08	4:42	4:59	4:51	4:55	5:08	4:51	5:03	4:56
JULY										
5	5:25	5:12	4:46	5:03	4:55	4:59	5:12	4:55	5:06	4:59
15	5:35	5:23	4:58	5:14	5:06	5:09	5:21	5:05	5:16	5:09
30	5:55	5:44	5:22	5:35	5:28	5:30	5:40	5:26	5:35	5:29
AUGUST										
4	6:02	5:51	5:31	5:42	5:35	5:38	5:48	5:33	5:42	5:36
14	6:17	6:07	5:48	5:58	5:55	5:53	6:02	5:49	5:57	5:51
29	6:38	6:30	6:15	6:21	6:16	6:17	6:23	6:12	6:18	6:13
SEPTEMBER										
3	6:46	6:38	6:23	6:29	6:24	6:24	6:30	6:19	6:26	6:20
18	7:07	7:00	6:48	6:51	6:47	6:47	6:51	6:41	6:46	6:41
28	7:20	7:15	7:05	7:06	7:02	7:01	7:05	6:56	7:00	6:54
OCTOBER										
3	7:27	7:22	7:13	7:13	7:09	7:09	7:11	7:03	7:07	7:01
18	7:48	7:44	7:37	7:35	7:32	7:31	7:32	7:05	7:27	7:22
28	7:02	6:59	6:54	6:50	6:48	6:46	6:46	6:40	6:41	6:36
NOVEMBER										
2	7:09	7:07	7:02	6:58	6:55	6:53	6:53	6:47	6:48	6:43
17	7:31	7:29	7:26	7:20	7:18	7:15	7:14	7:09	7:09	7:05
27	7:44	7:43	7:41	7:33	7:32	7:29	7:27	7:22	7:22	7:18
DECEMBER										
2	7:50	7:49	7:47	7:40	7:38	7:35	7:32	7:28	7:28	7:24
17	8:03	8:03	8:02	7:54	7:53	7:49	7:46	7:43	7:42	7:37
31	8:09	8:09	8:08	7:59	7:58	7:55	7:52	7:48	7:48	7:43

NOTES:
1. First light occurs approximately one half hour before sunrise.

TABLE 4.8
OPTION 3
ISLAND WITH NEW STANDARD TIME (PLUS ONE HALF HOUR)
AND EXISTING DAYLIGHT SAVING TIME - MARCH - OCTOBER
LAST LIGHT - P.M.

Date	Port Aux Basques	Corner Brook	St. Anthony	Grand Falls	Twillingate	Gander	Marystown	Bonavista	Argentia	St. John's
JANUARY										
1	5:51	5:42	5:24	5:33	5:27	5:29	5:37	5:24	5:32	5:26
16	6:08	6:00	5:43	5:50	5:45	5:46	5:53	5:41	5:48	5:42
31	6:29	6:21	6:06	6:12	6:07	6:08	6:14	6.03	6:09	6:03
FEBRUARY										
5	6:36	6:29	6:15	6:20	6:15	6:15	6:21	6:10	6:16	6:11
15	6:51	6:45	6:32	6:36	6:31	6:31	6:36	6:26	6:31	6:25
25	7:06	7:00	6:49	6:51	6:47	6:47	6:50	6:41	6:46	6:40
MARCH										
2	8:13	8:08	7:58	7:59	7:55	7:55	7:58	7:49	7:53	7:48
17	8:35	8:31	8:23	8:22	8:19	8:18	8:19	8:12	8:15	8:09
27	8:50	8:47	8:40	8:38	8:35	8:33	8:34	8:27	8:29	8:24
APRIL										
1	8:57	8:55	8:49	8:45	8:43	8:41	8:41	8:35	8:36	8:31
16	9:20	9:18	9:16	9:09	9:08	9:05	9:03	8:58	8:59	8:54
26	9:35	9:35	9:34	9:26	9:24	9:21	9:18	9:14	9:14	9:09
MAY										
1	9:43	9:43	9:43	9:34	9:33	9:29	9:25	9:22	9:21	9:17
16	10:05	10:07	10:10	9:58	9:58	9:53	9:47	9:46	9:43	9:39
31	10:24	10:27	10:33	10:18	10:19	10:14	10:06	10:06	10:02	9:58
JUNE										
5	10:29	10:33	10:40	10:23	10:24	10:19	10:11	10:11	10:07	10:03
15	10:36	10:40	10:48	10:31	10:32	10:27	10:18	10:19	10:14	10:10
30	10:38	10:42	10:49	10:33	10:34	10:28	10:20	10:21	10:16	10:12
JULY										
5	10:36	10:40	10:47	10:31	10:31	10:26	10:18	10:18	10:14	10:10
15	10:29	10:32	10:37	10:22	10:23	10:18	10:11	10:11	10:07	10:03
30	10:10	10:12	10:14	10:02	10:02	9:58	9:53	9:51	9:49	9:44
AUGUST										
4	10:02	10:03	10:05	9:54	9:53	9:50	9:45	9:43	9:41	9:36
14	9:45	9:45	9:44	9:36	9:34	9:31	9:28	9:24	9:23	9:19
29	9:16	9:14	9:11	9:05	9:03	9:00	8:59	8:54	8:54	8:50
SEPTEMBER										
3	9:05	9:03	8:59	8:54	8:52	8:50	8:49	8:43	8:44	8:39
18	8:34	8:30	8:24	8:21	8:18	8:17	8:18	8:11	8:13	8:08
28	8:13	8:09	8:01	8:00	7:56	7:55	7:57	7:49	7:53	7:47
OCTOBER										
3	8:03	7:58	7:49	7:49	7:46	7:45	7:47	7:39	7:43	7:37
18	7:35	7:29	7:17	7:20	7:15	7:15	7:19	7:10	7:14	7:09
28	6:18	6:11	5:58	6:02	5:57	5:57	6:02	5:52	5:58	5:52
NOVEMBER										
2	6:10	6:03	5:49	5:54	5:49	5:50	5:55	5:44	5:50	5:44
17	5:52	5:44	5:28	5:35	5:29	5:30	5:37	5:25	5:32	5:26
27	5:44	5:36	5:19	5:27	5:21	5:22	5:30	5:17	5:25	5:19
DECEMBER										
2	5:42	5:33	5:16	5:24	5:18	5:20	5:27	5:15	5:22	5:16
17	5:42	5:33	5:14	5:23	5:17	5:19	5:27	5:14	5:22	5:16
31	5:50	5:41	5:23	5:32	5:26	5:27	5:36	5:23	5:31	5:24

NOTES:
1. Last light occurs approximately one half hour after sunset.

4. Adopt Double Daylight Saving Time from the First Sunday in April to the Last Sunday in October

During World War II, Double Daylight Saving Time, (2 hours of Daylight Saving Time), was used during the summer months. This proposal suggests extending Double Daylight Saving Time from the first Sunday in April to the last Sunday in October. Tables 4.9 and 4.10 along with Figures 4.10 to 4.12 display first and last light times under this case for various Island locations. This particular option is attractive in the Summer months because it advances the time of first light but does not advance it beyond 7:00 a.m., while last light persists until after 10:00 p.m. in April and until after 11:00 p.m. in the Summer on the West Coast of the Province. On the East Coast, last light occurs as late as 9:30 p.m. in April and 10:40 p.m. in the Summer.

This option may cause problems in the month of October when first light occurs after 8:00 a.m. almost right across the Island. The later evenings during this month may adequately compensate those adversely affected by this particular option.

FIGURE 4.10
CORNER BROOK
CIVIL TWILIGHT TIMES

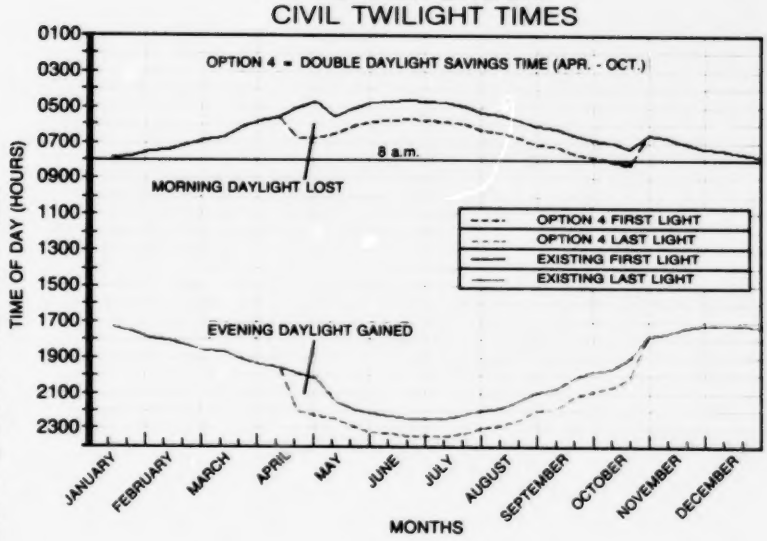

FIGURE 4.11
GRAND FALLS
CIVIL TWILIGHT TIMES

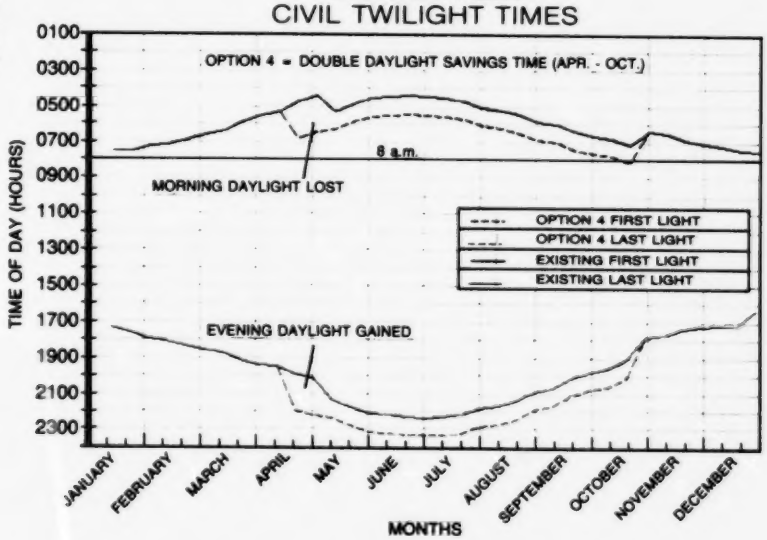

FIGURE 4.12
ST. JOHN'S
CIVIL TWILIGHT TIMES

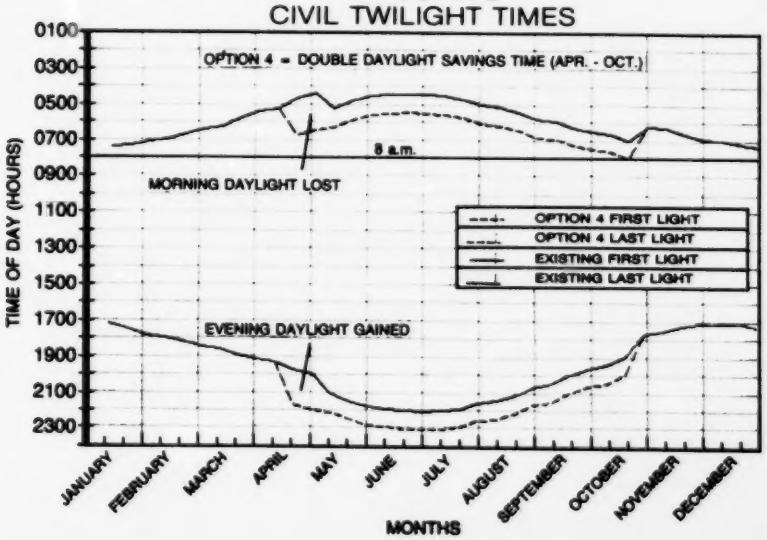

TABLE 4.9
OPTION 4
ISLAND EXISTING STANDARD TIME WITH
DOUBLE DAYLIGHT SAVING TIME FROM
APRIL - OCTOBER
FIRST LIGHT - A.M.

Date	Port Aux Basques	Corner Brook	St. Anthony	Grand Falls	Twillingate	Gander	Marystown	Bonavista	Argentia	St. John's
JANUARY										
1	7:39	7:39	7:38	7:29	7:28	7:25	7:22	7:18	7:18	7:13
16	7:35	7:34	7:32	7:25	7:23	7:20	7:18	7:14	7:14	7:09
31	7:22	7:20	7:16	7:11	7:09	7:06	7:05	7:00	7:01	6:56
FEBRUARY										
5	7:15	7:13	7:09	7:04	7:02	7:00	6:59	6:53	6:54	6:50
15	7:01	6:58	6:52	6:49	6:46	6:44	6:45	6:38	6:40	6:35
25	6:44	6:40	6:33	6:31	6:28	6:27	6:28	6:21	6:23	6:18
MARCH										
2	6:35	6:31	6:22	6:22	6:18	6:17	6:19	6:11	6:14	6:09
17	6:06	6:00	5:49	5:51	5:47	5:47	5:50	5:41	5:45	5:40
27	5:45	5:39	5:26	5:30	5:25	5:25	5:30	5:20	5:25	5:19
APRIL										
1	5:35	5:28	5:15	5:19	5:14	5:14	5:19	5:09	5:15	5:09
16	7:04	6:56	6:40	6:47	6:41	6:42	6:49	6:37	6:44	6:38
26	6:45	6:36	6:18	6:26	6:20	6:22	6:30	6:17	6:25	6:19
MAY										
1	6:36	6:26	6:07	6:17	6:11	6:12	6:21	6:08	6:16	6:10
16	6:12	6:00	5:38	5:51	5:44	5:47	5:57	5:43	5:52	5:46
31	5:55	5:42	5:17	5:33	5:25	5:29	5:41	5:25	5:36	5:29
JUNE										
5	5:51	5:38	5:13	5:29	5:21	5:25	5:37	5:21	5:32	5:25
15	5:48	5:34	5:08	5:25	5:17	5:21	5:34	5:17	5:29	5:22
30	5:52	5:38	5:12	5:29	5:21	5:25	5:38	5:21	5:33	5:26
JULY										
5	5:55	5:42	5:16	5:33	5:25	5:29	5:42	5:25	5:36	5:29
15	6:05	5:53	5:28	5:44	5:36	5:39	5:51	5:35	5:46	5:39
30	6:25	6:14	5:52	6:05	5:58	6:00	6:10	5:56	6:05	5:59
AUGUST										
4	6:32	6:21	6:01	6:12	6:05	6:08	6:18	6:03	6:12	6:06
14	6:47	6:37	6:18	6:28	6:22	6:23	6:32	6:19	6:27	6:21
29	7:08	7:00	6:45	6:51	6:46	6:47	6:53	6:42	6:48	6:43
SEPTEMBER										
3	7:16	7:08	6:53	6:59	6:54	6:54	7:00	6:49	6:56	6:50
18	7:37	7:30	7:18	7:21	7:17	7:17	7:21	7:11	7:16	7:11
28	7:50	7:45	7:35	7:36	7:32	7:31	7:35	7:26	7:30	7:24
OCTOBER										
3	7:57	7:52	7:43	7:43	7:39	7:39	7:41	7:33	7:37	7:31
18	8:18	8:14	8:07	8:05	8:02	8:01	8:02	7:55	7:57	7:52
28	6:32	6:29	6:24	6:20	6:18	6:16	6:16	6:10	6:11	6:06
NOVEMBER										
2	6:39	6:37	6:32	6:28	6:25	6:23	6:23	6:17	6:18	6:13
17	7:01	6:59	6:56	6:50	6:48	6:45	6:44	6:39	6:39	6:35
27	7:14	7:13	7:11	7:03	7:02	6:59	6:57	6:52	6:52	6:48
DECEMBER										
2	7:20	7:19	7:17	7:10	7:08	7:05	7:02	6:58	6:58	6:54
17	7:33	7:33	7:32	7:24	7:23	7:19	7:16	7:13	7:12	7:07
31	7:39	7:39	7:38	7:29	7:28	7:25	7:22	7:18	7:18	7:13

NOTES:
1. First light occurs approximately one half hour before sunrise.

TABLE 4.10
OPTION 4
ISLAND EXISTING STANDARD TIME WITH
DOUBLE DAYLIGHT SAVING TIME FROM
APRIL - OCTOBER
LAST LIGHT - P.M.

Date	Port Aux Basques	Corner Brook	St. Anthony	Grand Falls	Twillingate	Gander	Marystown	Bonavista	Argentia	St. John's
JANUARY										
1	5:21	5:12	4:54	5:03	4:57	4:59	5:07	4:54	5:02	4:56
16	5:38	5:30	5:13	5:20	5:15	5:16	5:23	5:11	5:18	5:12
31	5:59	5:51	5:36	5:42	5:37	5:38	5:44	5:33	5:39	5:33
FEBRUARY										
5	6:06	5:59	5:45	5:50	5:45	5:45	5:51	5:40	5:46	5:41
15	6:21	6:15	6:02	6:06	6:01	6:01	6:06	5:56	6:01	5:55
25	6:36	6:30	6:19	6:21	6:17	6:17	6:20	6:11	6:16	6:10
MARCH										
2	6:43	6:38	6:28	6:29	6:25	6:25	6:28	6:19	6:23	6:18
17	7:05	7:01	6:53	6:52	6:49	6:48	6:49	6:42	6:45	6:39
27	7:20	7:17	7:10	7:08	7:05	7:03	7:04	6:57	6:59	6:54
APRIL										
1	7:27	7:25	7:19	7:15	7:13	7:11	7:11	7:05	7:06	7:01
16	9:50	9:48	9:46	9:39	9:38	9:35	9:33	9:28	9:29	9:24
26	10:05	10:05	10:04	9:56	9:54	9:51	9:48	9:44	9:44	9:39
MAY										
1	10:13	10:13	10:13	10:04	10:03	9:59	9:55	9:52	9:51	9:47
16	10:35	10:37	10:40	10:28	10:28	10:23	10:17	10:16	10:13	10:09
31	10:54	10:57	11:03	10:48	10:49	10:44	10:36	10:36	10:32	10:28
JUNE										
5	10:59	11:03	11:10	10:53	10:54	10:49	10:41	10:41	10:37	10:33
15	11:06	11:10	11:18	11:01	11:02	10:57	10:48	10:49	10:44	10:40
30	11:08	11:12	11:19	11:03	11:04	10:58	10:50	10:51	10:46	10:42
JULY										
5	11:06	11:10	11:17	11:01	11:01	10:56	10:48	10:48	10:44	10:40
15	10:59	11:02	11:07	10:52	10:53	10:48	10:41	10:41	10:37	10:33
30	10:40	10:42	10:44	10:32	10:32	10:28	10:23	10:21	10:19	10:14
AUGUST										
4	10:32	10:33	10:35	10:24	10:23	10:20	10:15	10:13	10:11	10:06
14	10:15	10:15	10:14	10:06	10:04	10:01	9:58	9:54	9:53	9:49
29	9:46	9:44	9:41	9:35	9:33	9:30	9:29	9:24	9:24	9:20
SEPTEMBER										
3	9:35	9:33	9:29	9:24	9:22	9:20	9:19	9:13	9:14	9:09
18	9:04	9:00	8:54	8:51	8:48	8:47	8:48	8:41	8:43	8:38
28	8:43	8:39	8:31	8:30	8:26	8:25	8:27	8:19	8:23	8:17
OCTOBER										
3	8:33	8:28	8:19	8:19	8:16	8:15	8:17	8:09	8:13	8:07
18	8:05	7:59	7:47	7:50	7:45	7:45	7:49	7:40	7:44	7:39
28	5:48	5:41	5:28	5:32	5:27	5:27	5:32	5:22	5:28	5:22
NOVEMBER										
2	5:40	5:33	5:19	5:24	5:19	5:20	5:25	5:14	5:20	5:14
17	5:22	5:14	4:58	5:05	4:59	5:00	5:07	4:55	5:02	4:56
27	5:14	5:06	4:49	4:57	4:51	4:52	5:00	4:47	4:55	4:49
DECEMBER										
2	5:12	5:03	4:46	4:54	4:48	4:50	4:57	4:45	4:52	4:46
17	5:12	5:03	4:44	4:53	4:47	4:49	4:57	4:44	4:52	4:46
31	5:20	5:11	4:53	5:02	4:56	4:57	5:06	4:53	5:01	4:54

NOTES:
1. Last light occurs approximately one half hour after sunset.

5. Advance Newfoundland Standard Time One Half Hour and Adopt Double Daylight Saving Time from the First Sunday in April until the Last Sunday in October.

Tables 4.11 and 4.12 list first and last light times for the case of advancing Standard Time and adopting Double Daylight Savings Time for various Island locations. In addition, Figures 4.13 - 4.15 graphically present these times for Corner Brook, Grand Falls and St. John's.

Clearly, this option works well for the East Coast of the Province during the Winter, Spring and Summer months. On the West Coast a later dawn occurring after 8:00 a.m., may cause some problems. Difficulties with this option may be caused in October when first light occurs after 8:00 a.m. across the Province. On the West Coast first light occurs after 8:00 a.m. as early as September.

The greatest benefit of this particular option is the late evenings which result particularly in the Spring and Summer. Under this option, last light will extend to after 10:00 p.m. from mid-April to mid-September on the West Coast and from the end of April to the end of August on the East Coast. In the months of June and July, last light is after 11:00 right across the Province.

FIGURE 4.13
CORNER BROOK
CIVIL TWILIGHT TIMES

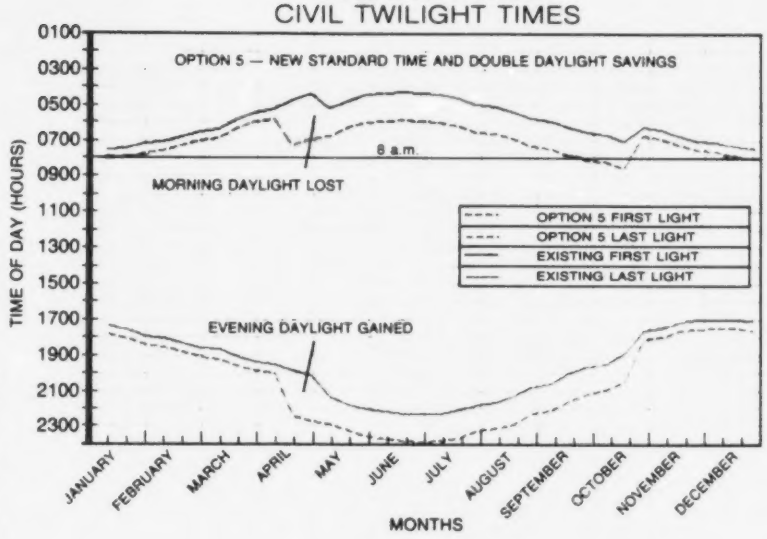

FIGURE 4.14
GRAND FALLS
CIVIL TWILIGHT TIMES

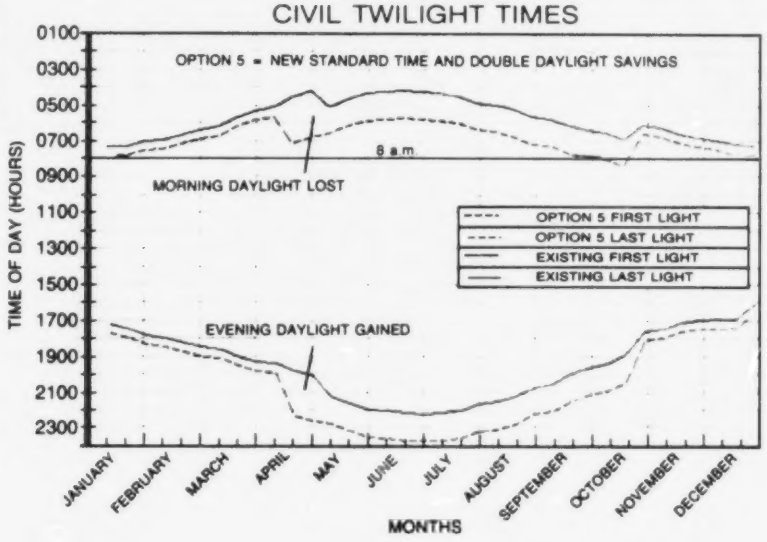

FIGURE 4.15
ST. JOHN'S
CIVIL TWILIGHT TIMES

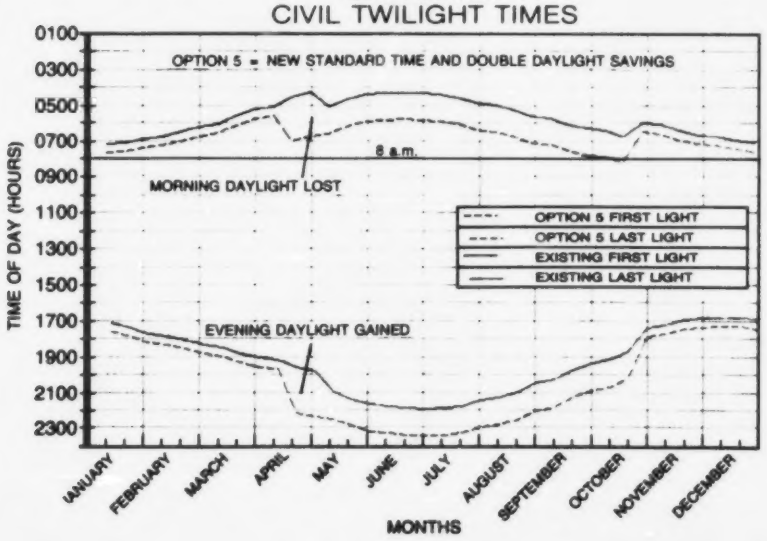

TABLE 4.11
OPTION 5
ISLAND WITH NEW STANDARD TIME (PLUS ONE HALF HOUR)
AND DOUBLE DAYLIGHT SAVING TIME - APRIL - OCTOBER
FIRST LIGHT - A.M.

Date	Port Aux Basques	Corner Brook	St. Anthony	Grand Falls	Twillingate	Gander	Marystown	Bonavista	Argentia	St. John's
JANUARY										
1	8:09	8:09	8:08	7:59	7:58	7:55	7:52	7:48	7:48	7:43
16	8:05	8:04	8:02	7:55	7:53	7:50	7:48	7:44	7:44	7:39
31	7:52	7:50	7:46	7:41	7:39	7:36	7:35	7:30	7:31	7:26
FEBRUARY										
5	7:45	7:43	7:39	7:34	7:32	7:30	7:29	7:23	7:24	7:20
15	7:31	7:28	7:22	7:19	7:16	7:14	7:15	7:08	7:10	7:05
25	7:14	7:10	7:03	7:01	6:58	6:57	6:58	6:51	6:53	6:48
MARCH										
2	7:05	7:01	6:52	6:52	6:48	6:47	6:49	6:41	6:44	6:39
17	6:36	6:30	6:19	6:21	6:17	6:17	6:20	6:11	6:15	6:10
27	6:15	6:09	5:56	6:00	5:55	5:55	6:00	5:50	5:55	5:49
APRIL										
1	6:05	5:58	5:45	5:49	5:44	5:44	5:49	5:39	5:45	5:39
16	7:34	7:26	7:10	7:17	7:11	7:12	7:19	7:07	7:14	7:08
26	7:15	7:06	6:48	6:56	6:50	6:52	7:00	6:47	6:55	6:49
MAY										
1	7:06	6:56	6:37	6:47	6:41	6:42	6:51	6:38	6:46	6:40
16	6:42	6:30	6:08	6:21	6:14	6:17	6:27	6:13	6:22	6:16
31	6:25	6:12	5:47	6:03	5:55	5:59	6:11	5:55	6:06	5:59
JUNE										
5	6:21	6:08	5:43	5:59	5:51	5:55	6:07	5:51	6:02	5:55
15	6:18	6:04	5:38	5:55	5:47	5:51	6:04	5:47	5:59	5:52
30	6:22	6:08	5:42	5:59	5:51	5:55	6:08	5:51	6:03	5:56
JULY										
5	6:25	6:12	5:46	6:03	5:55	5:59	6:12	5:55	6:06	5:49
15	6:35	6:23	5:58	6:14	6:06	6:09	6:21	6:05	6:16	6:09
30	6:55	6:44	6:22	6:35	6:28	6:30	6:40	6:26	6:35	6:29
AUGUST										
4	7:02	6:51	6:31	6:42	6:35	6:38	6:48	6:33	6:42	6:36
14	7:17	7:07	6:48	6:58	6:55	6:53	7:02	6:49	6:57	6:51
29	7:38	7:30	7:15	7:21	7:16	7:17	7:23	7:12	7:18	7:13
SEPTEMBER										
3	7:46	7:38	7:23	7:29	7:24	7:24	7:30	7:19	7:26	7:20
18	8:07	8:00	7:48	7:51	7:47	7:47	7:51	7:41	7:46	7:41
28	8:20	8:15	8:05	8:06	8:02	8:01	8:05	7:56	8:00	7:54
OCTOBER										
3	8:27	8:22	8:13	8:13	8:09	8:09	8:11	8:03	8:07	8:01
18	8:48	8:44	8:37	8:35	8:32	8:31	8:32	8:05	8:27	8:22
28	7:02	6:59	6:54	6:50	6:48	6:46	6:46	6:40	6:41	6:36
NOVEMBER										
2	7:09	7:07	7:02	6:58	6:55	6:53	6:53	6:47	6:48	6:43
17	7:31	7:29	7:26	7:20	7:18	7:15	7:14	7:09	7:09	7:05
27	7:44	7:43	7:41	7:33	7:32	7:29	7:27	7:22	7:22	7:18
DECEMBER										
2	7:50	7:49	7:47	7:40	7:38	7:35	7:32	7:28	7:28	7:24
17	8:03	8:03	8:02	7:54	7:53	7:49	7:46	7:43	7:42	7:37
31	8:09	8:09	8:08	7:59	7:58	7:55	7:52	7:48	7:48	7:43

NOTES:
1. First light occurs approximately one half hour before sunrise.

TABLE 4.12
OPTION 5
ISLAND WITH NEW STANDARD TIME (PLUS ONE HALF HOUR)
AND DOUBLE DAYLIGHT SAVING TIME - APRIL - OCTOBER
LAST LIGHT - P.M.

Date	Port Aux Basques	Corner Brook	St. Anthony	Grand Falls	Twillingate	Gander	Marystown	Bonavista	Argentia	St. John's
JANUARY										
1	5:51	5:42	5:24	5:33	5:27	5:29	5:37	5:24	5:32	5:26
16	6:08	6:00	5:43	5:50	5:45	5:46	5:53	5:41	5:48	5:42
31	6:29	6:21	6:06	6:12	6:07	6:08	6:14	6:03	6:09	6:03
FEBRUARY										
5	6:36	6:29	6:15	6:20	6:15	6:15	6:21	6:10	6:16	6:11
15	6:51	6:45	6:32	6:36	6:31	6:31	6:36	6:26	6:31	6:25
25	7:06	7:00	6:49	6:51	6:47	6:47	6:50	6:41	6:46	6:40
MARCH										
2	7:13	7:08	6:58	6:59	6:55	6:55	6:58	6:49	6:53	6:48
17	7:35	7:31	7:23	7:22	7:19	7:18	7:19	7:12	7:15	7:09
27	7:50	7:47	7:40	7:38	7:35	7:33	7:34	7:27	7:29	7:24
APRIL										
1	7:57	7:55	7:49	7:45	7:43	7:41	7:41	7:35	7:36	7:31
16	10:20	10:18	10:16	10:09	10:08	10:05	10:03	9:58	9:59	9:54
26	10:35	10:35	10:34	10:26	10:24	10:21	10:18	10:14	10:14	10:09
MAY										
1	10:43	10:43	10:43	10:34	10:33	10:29	10:25	10:22	10:21	10:17
16	11:05	11:07	11:10	10:58	10:58	10:53	10:47	10:46	10:43	10:39
31	11:24	11:27	11:33	11:18	11:19	11:14	11:06	11:06	11:02	10:58
JUNE										
5	11:29	11:33	11:40	11:23	11:24	11:19	11:11	11:11	11:07	11:03
15	11:36	11:40	11:48	11:31	11:32	11:27	11:18	11:19	11:14	11:10
30	11:38	11:42	11:49	11:33	11:34	11:28	11:20	11:21	11:16	11:12
JULY										
5	11:36	11:40	11:47	11:31	11:31	11:26	11:18	11:18	11:14	11:10
15	11:29	11:32	11:37	11:22	11:23	11:18	11:11	11:11	11:07	11:03
30	11:10	11:12	11:14	11:02	11:02	10:58	10:53	10:51	10:49	10:44
AUGUST										
4	11:02	11:03	11:05	10:54	10:53	10:50	10:45	10:43	10:41	10:36
14	10:45	10:45	10:44	10:36	10:34	10:31	10:28	10:24	10:23	10:19
29	10:16	10:14	10:11	10:05	10:03	10:00	9:59	9:54	9:54	9:50
SEPTEMBER										
3	10:05	10:03	9:59	9:54	9:52	9:50	9:49	9:43	9:44	9:39
18	9:34	9:30	9:24	9:21	9:18	9:17	9:18	9:11	9:13	9:08
28	9:13	9:09	9:01	9:00	8:56	8:55	8:57	8:49	8:53	8:47
OCTOBER										
3	9:03	8:58	8:49	8:49	8:46	8:45	8:47	8:39	8:43	8:37
18	8:35	8:29	8:17	8:20	8:15	8:15	8:19	8:10	8:14	8:09
28	6:18	6:11	5:58	6:02	5:57	5:57	6:02	5:52	5:58	5:52
NOVEMBER										
2	6:10	6:03	5:49	5:54	5:49	5:50	5:55	5:44	5:50	5:44
17	5:52	5:44	5:28	5:35	5:29	5:30	5:37	5:25	5:32	5:26
27	5:44	5:36	5:19	5:27	5:21	5:22	5:30	5:17	5:25	5:19
DECEMBER										
2	5:42	5:33	5:16	5:24	5:18	5:20	5:27	5:15	5:22	5:16
17	5:42	5:33	5:14	5:23	5:17	5:19	5:27	5:14	5:22	5:16
31	5:50	5:41	5:23	5:32	5:26	5:27	5:36	5:23	5:31	5:24

NOTES:
1. Last light occurs approximately one half hour after sunset.

B. LABRADOR

Under the current legislation the Labrador part of the Province should be on Newfoundland Standard Time. It is only by convention and for convenience that most of Labrador adopted Atlantic Standard Time. Communities along the Straits of Belle Isle in Labrador observe Newfoundland Standard Time. Tables 4.13 and 4.14 list first and last light times for three major centres in Labrador namely: Goose Bay, Churchill Falls and Labrador City. These tables demonstrate that there is much wasted daylight in this part of the Province as well. First light often occurs anywhere from 3:00 a.m. to 6:00 a.m. during the Spring and Summer months in Labrador. This indicates that there is considerable scope for improved utilization of daylight in this part of the Province. The options that exist for recapturing this lost daylight for Labrador parallel those for the Island portion of the Province and were outlined on page 2. Each will be examined in turn.

1. Extend Daylight Saving Time from the First Sunday in March to the Last Sunday in October.

Tables 4.15 and 4.16 demonstrate the effects on first and last light times which would result if Daylight Saving Time was extended from the first Sunday in March to the last Sunday in October, in Labrador. This option recaptures much of the lost daylight in the Spring in Labrador. First light is still before 7:00 a.m. for most of March, and throughout the Spring and Summer. Last light times in the Spring are favourably influenced, as well, ranging from 7:00 p.m. to 9:00 p.m. Figure 4.16 demonstrates graphically, the effect that this change will have on Churchill Falls, as well.

2. Advance Standard Time One Half Hour

Tables 4.17 and 4.18 demonstrate what the effects of advancing Labrador's standard time by one half hour will be for that part of the Province. First light would occur after 8:00 a.m. only during the months of December and January for most of Labrador. Labrador City, however, may experience some difficulties with this option because it results in late mornings from November until February. This option would also extend light later in the evenings with the most pleasing effects occurring during the summer months when last light would extend up to and beyond 11:00 p.m. Figure 4.17 graphically demonstrate what this particular option will mean for Churchill Falls.

FIGURE 4.16
CHURCHILL FALLS
CIVIL TWILIGHT TIMES

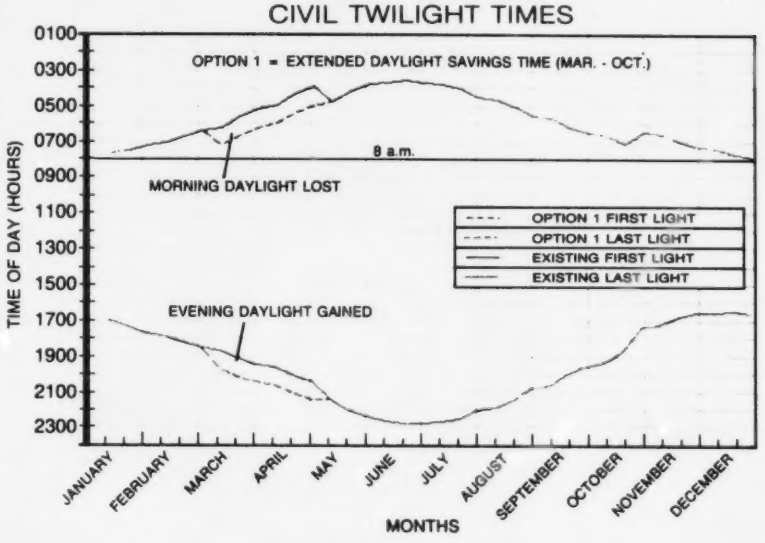

FIGURE 4.17
CHURCHILL FALLS
CIVIL TWILIGHT TIMES

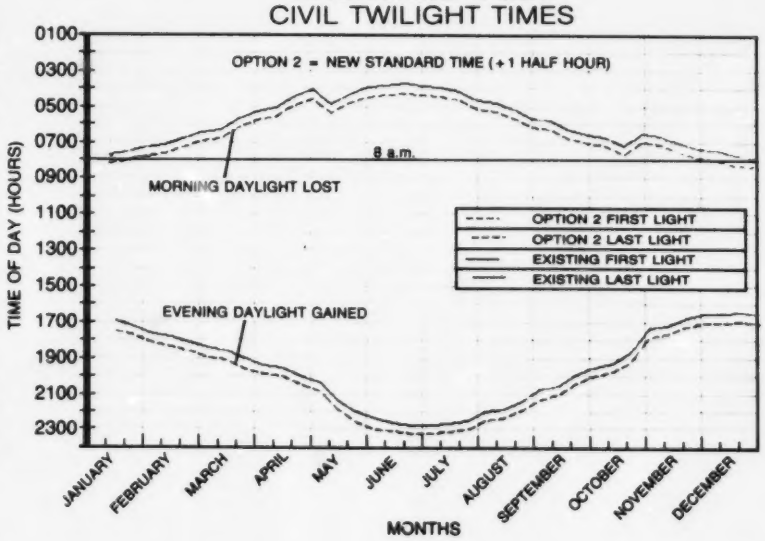

TABLE 4.13
LABRADOR (ATLANTIC TIME) EXISTING SYSTEM
FIRST LIGHT - A.M.

Date	Goose Bay	Churchill Falls	Labrador City
JANUARY			
1	7:35	7:50	7:59
16	7:28	7:43	7:52
31	7:10	7:25	7:35
FEBRUARY			
5	7:02	7:17	7:27
15	6:44	6:59	7:10
25	6:24	6:38	6:49
MARCH			
2	6:13	6:27	6:38
17	5:37	5:52	6:04
27	5:13	5:27	5:39
APRIL			
1	5:00	5:14	5:27
16	4:23	4:37	4:50
26	3:59	4:13	4:27
MAY			
1	4:48	5:01	5:15
16	4:16	4:29	4:44
31	3:52	4:05	4:21
JUNE			
5	3:47	3:59	4:16
15	3:41	3:53	4:10
30	3:45	3:58	4:15
JULY			
5	3:50	4:02	4:19
15	4:04	4:16	4:33
30	4:30	4:43	4:58
AUGUST			
4	4:40	4:53	5:08
14	4:59	5:13	5:27
29	5:28	5:42	5:55
SEPTEMBER			
3	5:38	5:51	6:05
18	6:05	6:19	6:32
28	6:23	6:37	6:49
OCTOBER			
3	6:32	6:46	6:58
18	6:58	7:13	7:24
28	6:16	6:31	6:41
NOVEMBER			
2	6:25	6:40	6:50
17	6:51	7:06	7:16
27	7:07	7:22	7:31
DECEMBER			
2	7:14	7:29	7:38
17	7:29	7:45	7:54
31	7:35	7:50	7:59

NOTES:
1. Times were presented by Dr. Paul Feldman of the Herzberg Institute of Astrophysics, a Division of the National Research Council of Canada.
2. Times are for 1986.
3. First light occurs approximately one half hour before sunrise.

TABLE 4.14
LABRADOR (ATLANTIC TIME) EXISTING SYSTEM
LAST LIGHT - P.M.

Date	Goose Bay	Churchill Falls	Labrador City
JANUARY			
1	4:36	4:50	5:04
16	4:56	5:09	5:23
31	5:21	5:35	5:48
FEBRUARY			
5	5:30	5:44	5:57
15	5:48	6:02	6:15
25	6:07	6:21	6:33
MARCH			
2	6:16	6:30	6:42
17	6:44	6:59	7:10
27	7:03	7:17	7:28
APRIL			
1	7:12	7:27	7:37
16	7:41	7:56	8:06
26	8:01	8:17	8:26
MAY			
1	9:11	9:27	9:36
16	9:41	9:57	10:05
31	10:07	10:24	10:30
JUNE			
5	10:14	10:31	10:37
15	10:24	10:40	10:46
30	10:25	10:41	10:47
JULY			
5	10:22	10:38	10:44
15	10:11	10:27	10:34
30	9:45	10:00	10:08
AUGUST			
4	9:34	9:50	9:58
14	9:12	9:27	9:36
29	8:36	8:51	9:00
SEPTEMBER			
3	8:23	8:38	8:48
18	7:45	8:00	8:11
28	7:21	7:35	7:47
OCTOBER			
3	7:09	7:23	7:35
18	6:35	6:49	7:01
28	5:14	5:28	5:41
NOVEMBER			
2	5:05	5:19	5:32
17	4:42	4:56	5:09
27	4:32	4:45	4:59
DECEMBER			
2	4:28	4:42	4:56
17	4:26	4:40	4:54
31	4:35	4:48	5:02

NOTES:
1. Times were prepared by Dr. Paul Feldman of the Herzberg Institute of Astrophysics, a Division of the National Research Council of Canada.
2. Times are for 1986.
3. Last light occurs approximately one half hour after sunset.

TABLE 4.15
OPTION 1
LABRADOR (ATLANTIC TIME) EXISTING SYSTEM
AND EXTENDED DAYLIGHT SAVING TIME
(MARCH - OCTOBER)
FIRST LIGHT - A.M.

Date	Goose Bay	Churchill Falls	Labrador City
JANUARY			
1	7:35	7:50	7:59
16	7:28	7:43	7:52
31	7:10	7:25	7:35
FEBRUARY			
5	7:02	7:17	7:27
15	6:44	6:59	7:10
25	6:24	6:38	6:49
MARCH			
2	7:13	7:27	7:38
17	6:37	6:52	7:04
27	6:13	6:27	6:39
APRIL			
1	6:00	6:14	6:27
16	5:23	5:37	5:50
26	4:59	5:13	5:27
MAY			
1	4:48	5:01	5:15
16	4:16	4:29	4:44
31	3:52	4:05	4:21
JUNE			
5	3:47	3:59	4:16
15	3:41	3:53	4:10
30	3:45	3:58	4:15
JULY			
5	3:50	4:02	4:19
15	4:04	4:16	4:33
30	4:30	4:43	4:58
AUGUST			
4	4:40	4:53	5:08
14	4:59	5:13	5:27
29	5:28	5:42	5:55
SEPTEMBER			
3	5:38	5:51	6:05
18	6:05	6:19	6:32
28	6:23	6:37	6:49
OCTOBER			
3	6:32	6:46	6:58
18	6:58	7:13	7:24
28	6:16	6:31	6:41
NOVEMBER			
2	6:25	6:40	6:50
17	6:51	7:06	7:16
27	7:07	7:22	7:31
DECEMBER			
2	7:14	7:29	7:38
17	7:29	7:45	7:54
31	7:35	7:50	7:59

NOTES:
1. First light occurs approximately one half hour before sunrise.

TABLE 4.16
OPTION 1
LABRADOR (ATLANTIC TIME) EXISTING SYSTEM
AND EXTENDED DAYLIGHT SAVING TIME
(MARCH - OCTOBER)
LAST LIGHT - P.M.

Date	Goose Bay	Churchill Falls	Labrador City
JANUARY			
1	4:36	4:50	5:04
16	4:56	5:09	5:23
31	5:21	5:35	5:48
FEBRUARY			
5	5:30	5:44	5:57
15	5:48	6:02	6:15
25	6:07	6:21	6:33
MARCH			
2	7:16	7:30	7:42
17	7:44	7:59	8:10
27	8:03	8:17	8:28
APRIL			
1	8:12	8:27	8:37
16	8:41	8:56	9:06
26	9:01	9:17	9:26
MAY			
1	9:11	9:27	9:36
16	9:41	9:57	10:05
31	10:07	10:24	10:30
JUNE			
5	10:14	10:31	10:37
15	10:24	10:40	10:46
30	10:25	10:41	10:47
JULY			
5	10:22	10:38	10:44
15	10:11	10:27	10:34
30	9:45	10:00	10:08
AUGUST			
4	9:34	9:50	9:58
14	9:12	9:27	9:36
29	8:36	8:51	9:00
SEPTEMBER			
3	8:23	8:38	8:48
18	7:45	8:00	8:11
28	7:21	7:35	7:47
OCTOBER			
3	7:09	7:23	7:35
18	6:35	6:49	7:01
28	5:14	5:28	5:41
NOVEMBER			
2	5:05	5:19	5:32
17	4:42	4:56	5:09
27	4:32	4:45	4:59
DECEMBER			
2	4:28	4:42	4:56
17	4:26	4:40	4:54
31	4:35	4:48	5:02

NOTES:
1. Last light occurs approximately one half hour after sunset.

TABLE 4.17
OPTION 2
LABRADOR (ATLANTIC TIME), NEW STANDARD TIME PLUS ONE HALF HOUR TO JOIN THE EXISTING NEWFOUNDLAND STANDARD TIME ZONE WITH EXISTING DAYLIGHT SAVING TIME
FIRST LIGHT - A.M.

Date	Goose Bay	Churchill Falls	Labrador City
JANUARY			
1	8:05	8:20	8:29
16	7:58	8:13	8:22
31	7:40	7:55	8:05
FEBRUARY			
5	7:32	7:47	7:57
15	7:14	7:29	7:40
25	6:54	7:08	7:19
MARCH			
2	6:43	6:57	7:08
17	6:07	6:22	6:34
27	5:43	5:57	6:09
APRIL			
1	5:30	5:44	5:57
16	4:53	5:07	5:20
26	4:29	4:43	4:57
MAY			
1	5:18	5:31	5:45
16	4:46	4:59	5:14
31	4:22	4:35	4:51
JUNE			
5	4:17	4:29	4:46
15	4:11	4:23	4:40
30	4:15	4:28	4:45
JULY			
5	4:20	4:32	4:49
15	4:34	4:46	5:03
30	5:00	5:13	5:28
AUGUST			
4	5:10	5:23	5:38
14	5:29	5:43	5:57
29	5:58	6:12	6:25
SEPTEMBER			
3	6:08	6:21	6:35
18	6:35	6:49	7:02
28	6:53	7:07	7:19
OCTOBER			
3	7:02	7:16	7:28
18	7:28	7:43	7:54
28	6:46	7:01	7:11
NOVEMBER			
2	6:55	7:10	7:20
17	7:21	7:36	7:46
27	7:37	7:52	8:01
DECEMBER			
2	7:44	7:59	8:08
17	7:59	8:15	8:24
31	8:05	8:20	8:29

NOTES:
1. First light occurs approximately one half hour before sunrise.

TABLE 4.18
OPTION 2
LABRADOR (ATLANTIC TIME), NEW STANDARD TIME PLUS ONE HALF HOUR TO JOIN THE EXISTING NEWFOUNDLAND STANDARD TIME ZONE WITH EXISTING DAYLIGHT SAVING TIME
LAST LIGHT - A.M.

Date	Goose Bay	Churchill Falls	Labrador City
JANUARY			
1	5:06	5:20	5:34
16	5:26	5:39	5:53
31	5:51	6:05	6:18
FEBRUARY			
5	6:00	6:14	6:27
15	6:18	6:32	6:45
25	6:37	6:51	7:03
MARCH			
2	6:46	7:00	7:12
17	7:14	7:29	7:40
27	7:33	7:47	7:58
APRIL			
1	7:42	7:57	8:07
16	8:11	8:26	8:36
26	8:31	8:47	8:56
MAY			
1	9:41	9:57	10:06
16	10:11	10:27	10:35
31	10:37	10:54	11:00
JUNE			
5	10:44	11:01	11:07
15	10:54	11:10	11:16
30	10:55	11:11	11:17
JULY			
5	10:52	11:08	11:14
15	10:41	10:57	11:04
30	10:15	10:30	10:38
AUGUST			
4	10:04	10:20	10:28
14	9:42	9:57	10:06
29	9:06	9:21	9:30
SEPTEMBER			
3	8:53	9:08	9:18
18	8:15	8:30	8:41
28	7:51	8:05	8:17
OCTOBER			
3	7:39	7:53	8:05
18	7:05	7:19	7:31
28	5:44	5:58	6:11
NOVEMBER			
2	5:35	5:49	6:02
17	5:12	5:26	5:39
27	5:02	5:15	5:29
DECEMBER			
2	4:58	5:12	5:26
17	4:56	5:10	5:24
31	5:05	5:18	5:32

NOTES:
1. Last light occurs approximately one half hour after sunset.

3. Extend Standard Time One Half Hour and Extend Daylight Saving Time From the First Sunday in March to the Last Sunday in October

Tables 4.19 and 4.20 along with Figure 4.18 demonstrate the effects on first and last light times when Standard Time is advanced and Daylight Saving Time is adopted in March. Again, Labrador City will experience late mornings in the winter months and first light will be around 8:00 a.m. early in March as well. For eastern Labrador, these changes will not result in very late mornings. In addition, these changes lengthen the daylight hours quite considerably with last light occurring after 8:00 p.m. from March to October right across Labrador.

4. Adopt Double Daylight Saving Time from the First Sunday in April to the Last Sunday in October

Adopting Double Daylight Savings Time works well for all of Labrador throughout the Spring and Summer months. Existing first and last light times prevail until the end of March. Then, as Tables 4.21 and 4.22 demonstrate, from April to October, much lost daylight is recaptured. First light times are still not after 8:00 a.m. under this option except in October. Labrador City in particular, may experience difficulties in this month but the later evenings may be adequate compensation. Again, this option has particularly favourable effects on last light times during the Summer months when daylight extends well into evening. Figure 4.19 displays the effects of this option on Churchill Falls.

5. Advance Standard Time One Half Hour and Adopt Double Daylight Savings Time from the First Sunday in April to the Last Sunday in October

Tables 4.23 and 4.24 along with Figure 4.20 display what the effects of advancing Standard Time and adopting Double Daylight Savings Time will be for Labrador. As with Option #2, problems may be caused by extended periods of late mornings in the winter, particularly for Western Labrador. As well, this particular option results in late mornings for all of Labrador in September and October.

6. Maintain the Status Quo and Acknowledge in the Legislation that Labrador Observes Atlantic Standard Time

In this case the Existing System as displayed in Tables 4.13 and 4.14 would prevail and no changes would be caused to first and last light times in Labrador.

FIGURE 4.18
CHURCHILL FALLS
CIVIL TWILIGHT TIMES

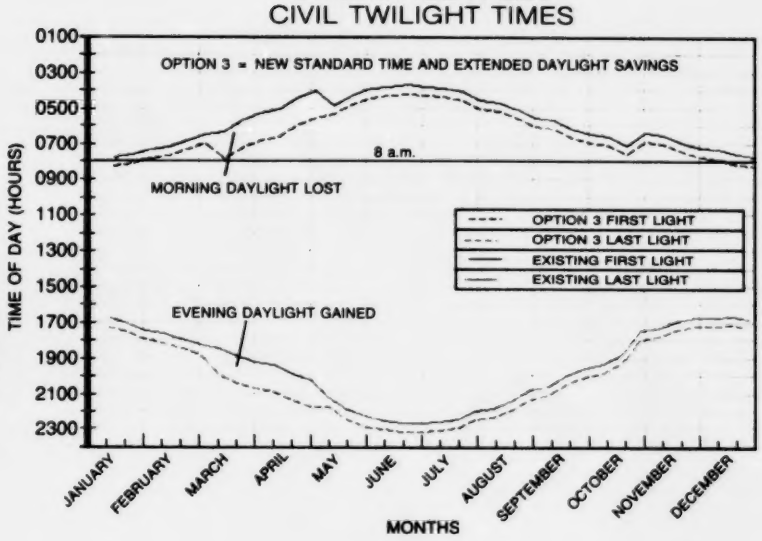

FIGURE 4.19
CHURCHILL FALLS
CIVIL TWILIGHT TIMES

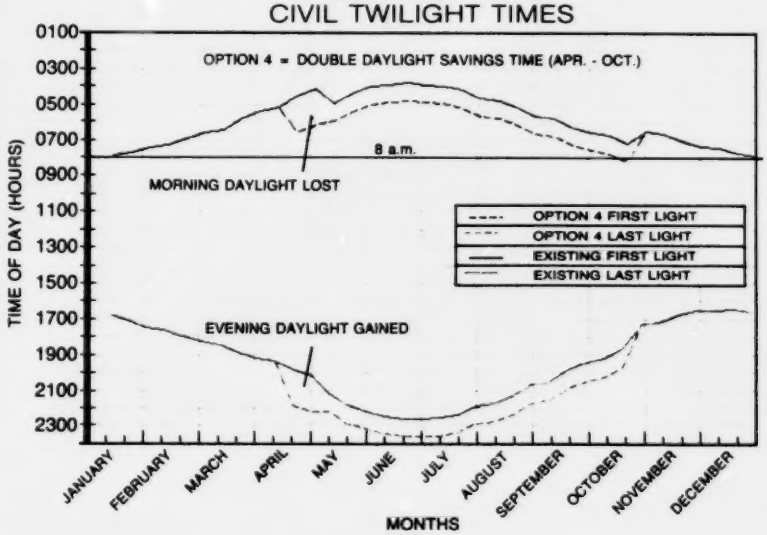

FIGURE 4.20
CHURCHILL FALLS
CIVIL TWILIGHT TIMES

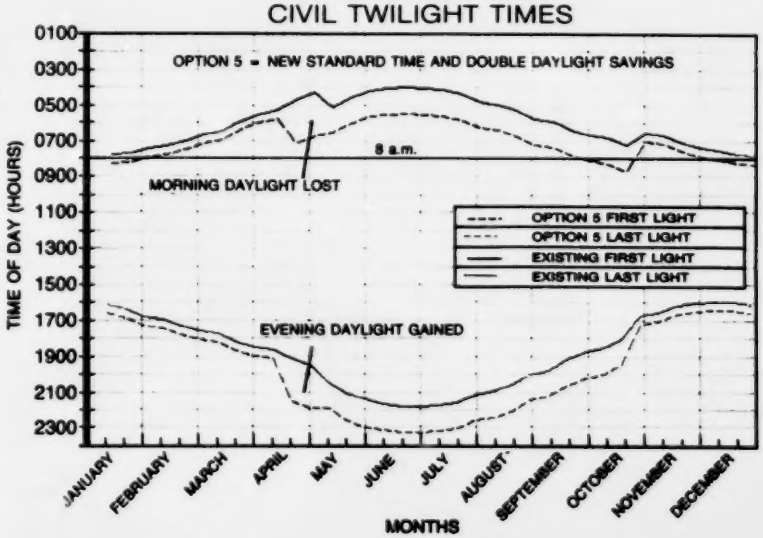

TABLE 4.19
OPTION 3
LABRADOR (ATLANTIC TIME), NEW STANDARD TIME PLUS ONE HALF HOUR WITH EXTENDED DAYLIGHT SAVING TIME
MARCH - OCTOBER
FIRST LIGHT - A.M.

Date	Goose Bay	Churchill Falls	Labrador City
JANUARY			
1	8:05	8:20	8:29
16	7:58	8:13	8:22
31	7:40	7:55	8:05
FEBRUARY			
5	7:32	7:47	7:57
15	7:14	7:29	7:40
25	6:54	7:08	7:19
MARCH			
2	7:43	7:57	8:08
17	7:07	7:22	7:34
27	6:43	6:57	7:09
APRIL			
1	6:30	6:44	6:57
16	5:53	6:07	6:20
26	5:29	5:43	5:57
MAY			
1	5:18	5:31	5:45
16	4:46	4:59	5:14
31	4:22	4:35	4:51
JUNE			
5	4:17	4:29	4:46
15	4:11	4:23	4:40
30	4:15	4:28	4:45
JULY			
5	4:20	4:32	4:49
15	4:34	4:46	5:03
30	5:00	5:13	5:28
AUGUST			
4	5:10	5:23	5:38
14	5:29	5:43	5:57
29	5:58	6:12	6:25
SEPTEMBER			
3	6:08	6:21	6:35
18	6:35	6:49	7:02
28	6:53	7:07	7:19
OCTOBER			
3	7:02	7:16	7:28
18	7:28	7:43	7:54
28	6:46	7:01	7:11
NOVEMBER			
2	6:55	7:10	7:20
17	7:21	7:36	7:46
27	7:37	7:52	8:01
DECEMBER			
2	7:44	7:59	8:08
17	7:59	8:15	8:24
31	8:05	8:20	8:29

NOTES:
1. First light occurs approximately one half hour before sunrise.

TABLE 4.20
OPTION 3
LABRADOR (ATLANTIC TIME), NEW STANDARD TIME PLUS ONE HALF HOUR WITH EXTENDED DAYLIGHT SAVING TIME
MARCH - OCTOBER
LAST LIGHT - P.M.

Date	Goose Bay	Churchill Falls	Labrador City
JANUARY			
1	5:06	5:20	5:34
16	5:26	5:39	5:53
31	5:51	6:05	6:18
FEBRUARY			
5	6:00	6:14	6:27
15	6:18	6:32	6:45
25	6:37	6:51	7:03
MARCH			
2	7:46	8:00	8:12
17	8:14	8:29	8:40
27	8:33	8:47	8:58
APRIL			
1	8:42	8:57	9:07
16	9:11	9:26	9:36
26	9:31	9:47	9:56
MAY			
1	9:41	9:57	10:06
16	10:11	10:27	10:35
31	10:37	10:54	11:00
JUNE			
5	10:44	11:01	11:07
15	10:54	11:10	11:16
30	10:55	11:11	11:17
JULY			
5	10:52	11:08	11:14
15	10:41	10:57	11:04
30	10:15	10:30	10:38
AUGUST			
4	10:04	10:20	10:28
14	9:42	9:57	10:06
29	9:06	9:21	9:30
SEPTEMBER			
3	8:53	9:08	9:18
18	8:15	8:30	8:41
28	7:51	8:05	8:17
OCTOBER			
3	7:39	7:53	8:05
18	7:05	7:19	7:31
28	5:44	5:58	6:11
NOVEMBER			
2	5:35	5:49	6:02
17	5:12	5:26	5:39
27	5:02	5:15	5:29
DECEMBER			
2	4:58	5:12	5:26
17	4:56	5:10	5:24
31	5:05	5:18	5:32

NOTES:
1. Last light occurs approximately one half hour after sunset.

TABLE 4.21
OPTION 4
LABRADOR (ATLANTIC TIME) WITH TWO HOURS OF DAYLIGHT SAVING TIME
APRIL - OCTOBER
FIRST LIGHT - A.M.

Date	Goose Bay	Churchill Falls	Labrador City
JANUARY			
1	7:35	7:50	7:59
16	7:28	7:43	7:52
31	7:10	7:25	7:35
FEBRUARY			
5	7:02	7:17	7:27
15	6:44	6:59	7:10
25	6:24	6:38	6:49
MARCH			
2	6:13	6:27	6:38
17	5:37	5:52	6:04
27	5:13	5:27	5:39
APRIL			
1	5:00	5:14	5:27
16	6:23	6:37	6:50
26	5:59	6:13	6:27
MAY			
1	5:48	6:01	6:15
16	5:16	5:29	5:44
31	4:52	5:05	5:21
JUNE			
5	4:47	4:59	5:16
15	4:41	4:53	5:10
30	4:45	4:58	5:15
JULY			
5	4:50	5:02	5:19
15	5:04	5:16	5:33
30	5:30	5:43	5:58
AUGUST			
4	5:40	5:53	6:08
14	5:59	6:13	6:27
29	6:28	6:42	6:55
SEPTEMBER			
3	6:38	6:51	7:05
18	7:05	7:19	7:32
28	7:23	7:37	7:49
OCTOBER			
3	7:32	7:46	7:58
18	7:58	8:13	8:24
28	6:16	6:31	6:41
NOVEMBER			
2	6:25	6:40	6:50
17	6:51	7:06	7:16
27	7:07	7:22	7:31
DECEMBER			
2	7:14	7:29	7:38
17	7:29	7:45	7:54
31	7:35	7:50	7:59

NOTES:

1. First light occurs approximately one half hour before sunrise.

TABLE 4.22
OPTION 4
LABRADOR (ATLANTIC TIME) WITH TWO HOURS OF DAYLIGHT SAVING TIME
APRIL - OCTOBER
LAST LIGHT - P.M.

Date	Goose Bay	Churchill Falls	Labrador City
JANUARY			
1	4:36	4:50	5:04
16	4:56	5:09	5:23
31	5:21	5:35	5:48
FEBRUARY			
5	5:30	5:44	5:57
15	5:48	6:02	6:15
25	6:07	6:21	6:33
MARCH			
2	6:16	6:30	6:42
17	6:44	6:59	7:10
27	7:03	7:17	7:28
APRIL			
1	7:12	7:27	7:37
16	9:41	9:56	10:06
26	10:01	10:17	10:26
MAY			
1	10:11	10:27	10:36
16	10:41	10:57	11:05
31	11:07	11:24	11:30
JUNE			
5	11:14	11:31	11:37
15	11:24	11:40	11:46
30	11:25	11:41	11:47
JULY			
5	11:22	11:38	11:44
15	11:11	11:27	11:34
30	10:45	11:00	11:08
AUGUST			
4	10:34	10:50	10:58
14	10:12	10:27	10:36
29	9:36	9:51	10:00
SEPTEMBER			
3	9:23	9:38	9:48
18	8:45	9:00	9:11
28	8:21	8:35	8:47
OCTOBER			
3	8:09	8:23	8:35
18	7:35	7:49	8:01
28	5:14	5:28	5:41
NOVEMBER			
2	5:05	5:19	5:32
17	4:42	4:56	5:09
27	4:32	4:45	4:59
DECEMBER			
2	4:28	4:42	4:56
17	4:26	4:40	4:54
31	4:35	4:48	5:02

NOTES:

1. Last light occurs approximately one half hour after sunset.

TABLE 4.23
OPTION 5
LABRADOR (ATLANTIC TIME), NEW STANDARD TIME
PLUS ONE HALF HOUR WITH TWO HOURS
OF DAYLIGHT SAVING TIME
APRIL - OCTOBER
FIRST LIGHT - A.M.

Date	Goose Bay	Churchill Falls	Labrador City
JANUARY			
1	8:05	8:20	8:29
16	7:58	8:13	8:22
31	7:40	7:55	8:05
FEBRUARY			
5	7:32	7:47	7:57
15	7:14	7:29	7:40
25	6:54	7:08	7:19
MARCH			
2	6:43	6:57	7:08
17	6:07	6:22	6:34
27	5:43	5:57	6:09
APRIL			
1	5:30	5:44	5:57
16	6:53	7:07	7:20
26	6:29	6:43	6:57
MAY			
1	6:18	6:31	6:45
16	5:46	5:59	6:14
31	5:22	5:35	5:51
JUNE			
5	5:17	5:29	5:46
15	5:11	5:23	5:40
30	5:15	5:28	5:45
JULY			
5	5:20	5:32	5:49
15	5:34	5:46	6:03
30	6:00	6:13	6:28
AUGUST			
4	6:10	6:23	6:38
14	6:29	6:43	6:57
29	6:58	7:12	7:25
SEPTEMBER			
3	7:08	7:21	7:35
18	7:35	7:49	8:02
28	7:53	8:07	8:19
OCTOBER			
3	8:02	8:16	8:28
18	8:28	8:43	8:54
28	6:46	7:01	7:11
NOVEMBER			
2	6:55	7:10	7:20
17	7:21	7:36	7:46
27	7:37	7:52	8:01
DECEMBER			
2	7:44	7:59	8:08
17	7:59	8:15	8:24
31	8:05	8:20	8:29

NOTES:
1. First light occurs approximately one half hour before sunrise.

TABLE 4.24
OPTION 5
LABRADOR (ATLANTIC TIME), NEW STANDARD TIME
PLUS ONE HALF HOUR WITH TWO HOURS
OF DAYLIGHT SAVING TIME
APRIL - OCTOBER
LAST LIGHT - P.M.

Date	Goose Bay	Churchill Falls	Labrador City
JANUARY			
1	5:06	5:20	5:34
16	5:26	5:39	5:53
31	5:51	6:05	6:18
FEBRUARY			
5	6:00	6:14	6:27
15	6:18	6:32	6:45
25	6:37	6:51	7:03
MARCH			
2	6:46	7:00	7:12
17	7:14	7:29	7:40
27	7:33	7:47	7:58
APRIL			
1	7:42	7:57	8:07
16	10:11	10:26	10:36
26	10:31	10:47	10:56
MAY			
1	10:41	10:57	11:06
16	11:11	11:27	11:36
31	11:37	11:54	12:00
JUNE			
5	11:44	12:01	12:07
15	11:54	12:10	12:16
30	11:55	12:11	12:17
JULY			
5	11:52	12:08	12:14
15	11:41	11:57	12:04
30	11:15	11:30	11:38
AUGUST			
4	11:04	11:20	11:28
14	10:42	10:57	11:06
29	10:06	10:21	10:30
SEPTEMBER			
3	9:53	10:08	10:18
18	9:15	9:30	9:41
28	8:51	9:05	9:17
OCTOBER			
3	8:39	8:53	9:05
18	8:05	8:19	8:31
28	5:44	5:58	6:11
NOVEMBER			
2	5:35	5:49	6:02
17	5:12	5:26	5:39
27	5:02	5:15	5:29
DECEMBER			
2	4:58	5:12	5:26
17	4:56	5:10	5:24
31	5:05	5:18	5:32

NOTES:
1. Last light occurs approximately one half hour after sunset.

5. CONCLUSION

The main arguments advanced for changing current time practices in Newfoundland would be to utilize daylight hours more effectively. A number of advantages and disadvantages to change have been discussed in this paper along with several options for change. It is also clear from historical and current practices that there is no taboo associated with changing time. The measurement of time is largely an arbitrary practice which can be changed to provide the greatest convenience to people. This paper presents some of the alternatives which are available.

Table 5.1 below ranks the options discussed in this paper by the extra number of daylight hours which will be transferred to the evening by each option every year.

The following table summarizes the annual daylight hours saved for each option.

TABLE 5.1
RANKING OF OPTIONS BY HOURS OF DAYLIGHT SAVED FOR THE EVENING

Option	Description	Hours of Daylight Saved Per Year
5	New Standard Time and Double Daylight Saving Time	406.5
3	New Standard Time and Extended Daylight Saving Time	238.5
4	Double Daylight Saving Time	224.0
2	New Standard Time	182.5
1	Extended Daylight Saving Time	56.0

Having reviewed the information, it is clear that, overall, Option 5, succeeds in shifting the greatest number of hours away from the morning to the evening. The problem with Option 5, as with Options 2, 3 and 4 is that first light will be after 8:00 a.m. for some or all provincial locations during certain times of the year. Option 5 results in first light after or close to 8:00 a.m. in September and October on the Avalon Peninsula, while on the West Coast of the Province, the problem extends through to December and January as well. In Western Labrador first light times after 8:00 a.m. are experienced from September to the beginning of February under Option 5. In this regard, the problems with late first light for Options 2 and 3 are confined to the months of December and January while for Option 4, October first light after 8:00 a.m. may be troublesome.

Option 1 which only saves 56 hours for the evening does not result in first light times after 8:00 a.m. on the Island while on the West Coast of Labrador, first light times very close to 8:00 a.m. would be experienced only in December and January.

The Government now wishes to receive responses from residents, groups, companies, organizations, and any other interested parties regarding this Green Paper and its suggestions for change. Following this, the Government will decide if any change in existing time practices is warranted.

APPENDIX A

NEWFOUNDLAND STANDARD TIME LEGISLATION

CHAPTER 270

An Act to Amend and Consolidate the Law Respecting Standard Time and Daylight Time in Newfoundland.

Short Title.

1. This Act. may be cited as The Newfoundland Standard Time Act.

Standard time.

2.—(1) Subject to this Act, time in Newfoundland shall be reckoned as three and one-half hours later than Greenwich mean solar time.

Idem.

(2) Time reckoned in accordance with subsection (1) shall be known as "Newfoundland Standard Time".

Daylight time.

3.—(1) During the period in each year between one minute after twelve o'clock in the forenoon of the last Sunday in April and one minute after twelve o'clock in the forenoon of the last Sunday in October time in Newfoundland shall be reckoned as two and one-half hours later than Grenwich mean solar time.

Idem.

(2) Time reckoned in accordance with subsection (1) shall be known as "Newfoundland Daylight Time".

4. Where

Interpretation of expressions relating to time.

(a) an expression of time reckoned or to be reckoned in Newfoundland occurs in

(i) an Act, proclamation, order of the Lieutenant-Governor in Council, regulation, order, rule, rule or order of a court, by-law, resolution or other enactment, whether of the foregoing kind or not, or

(ii) an agreement, contract, deed, lease or other instrument whether of the foregoing kind or not,

heretofore or hereafter enacted, made or executed:

(b) an hour or other period of time is stated either orally or in writing; or

(c) a question as to time arises.

the time referred to or intended shall, unless it is otherwise specifically expressed, be held to be time reckoned as prescribed by this Act.

APPENDIX B

GLOSSARY OF TERMS

Daylight Saving Time: a system of time in which clocks are set one hour in advance of standard time.

Double Daylight Saving Time: a system of time in which clocks are set two hours in advance of Standard Time.

First Light: refers to True Civil Twilight dawn which occurs when the sun is 6° below the horizon.

Greenwich Mean Time: refers to a system of Standard Time with Greenwich, England as the prime meridian. The world is divided into 24 time zones, each 15 degrees wide with the first centred on the Greenwich Meridian.

Last Light: refers to True Civil Twilight dusk which occurs when the sun is 6° beyond the horizon.